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# Missing School: The Relationship between Absenteeism and Achievement at the High School Level

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Missing School: The Relationship between Absenteeism and Achievement at the High

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iii

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

**Abstract**

In light of increased focus on student absenteeism from federal and state governmental agencies, this study examined the relationship between absenteeism and achievement in an urban high school in Pennsylvania. The purpose of this study was to investigate the relationship between absenteeism and Keystone Literature Exam scores. The study analyzed the connection between test scores and individual student class period attendance, both excused and unexcused, during the respective semester in which they were enrolled in a Keystone Exam related course (English II) and their corresponding Keystone Literature Exam score at the end of said course. The study also examined the impact of the school district's school board policy pertaining to attendance in its relation to Keystone Literature Exam scores. Analyses relied on a series of regressions to determine if there was a link between student attendance, attendance policy and achievement.

Results identified that unexcused absences and the total number of unexcused and excused absences, were significant predictors of exam scores. Further analysis of the relationship between unexcused absences and achievement revealed that the relationship did not vary with students enrolled in different high school buildings comprising the urban research site utilized in this study. The relationship between Keystone Literature Exam scores and unexcused absences was found to vary with students' ethnic minorities (white vs. non-white), special education students (yes vs. no), English Language Learners (yes vs. no), and economically disadvantaged status (yes vs. no). In addition, a large portion of the explained variance in scores could be attributed to prior

achievement.  Unexcused absences were still significant but only attributed to a small portion of the explained variance over and beyond prior achievement.  These results indicated the link between students' prior and current performance in high school.   Lastly, there was no significant differences between Keystone Literature Exam scores of students who violated the research site's attendance policy versus those students who did not violate the policy.

*Keywords:* attendance policy, Keystone Exam, absenteeism, unexcused absence, excused absence, high school, prior achievement

# CHAPTER 1

## Introduction and Rationale

Schools across the globe employ teachers to not only provide instruction for all grade level children, but to instill the necessary strategies and the necessary resources in order for said students to learn a particular set of skills. In its most basic form, traditional education grounds itself on the principles that students should attend school, teachers should instruct, and students should acquire knowledge in order to achieve a modicum of success. In the past, due to the constraints within our educational system, students were passive learners, whose main role was to receive knowledge that teachers provided through instruction (Yazzie-Mintz, 2010). More recently, education evolved into a more interactive, engaging, and reflective process between the student and the teacher (Parsons & Taylor, 2011; Yazzie-Mintz, 2010).

In many cases, when students are absent from the traditional school day, their learning suffers (Balfanz & Byrnes, 2013; Ginsberg, Jordan, & Chang, 2014). With support from both federal and individual state governmental agencies, schools create policies that implement consequences for student absenteeism in an effort to encourage students to attend school. These agencies encourage policies to deter absenteeism, while also calling for further investigation and analysis of individual student absences, not whole school averages of daily attendance (U.S. Department of Education, 2016). These attendance policies vary from state to state and from district to district. School districts distinguish between which criteria constitutes an excused absence versus an unexcused absence. Excused absences, typically, are when students are absent from school for a medical reason, funeral, or court appearance. Excused absences normally require proper

medical and/or legal documentation as to deter school administration from penalizing those students for their given absences. Unexcused absences, which are non-school approved absences, usually elicit a consequence by school administration for the given student. However, these consequences normally vary from district to district. Due to variations in policy and practice, further investigation is needed to determine the relationship between the state and federal government recommended policies and students.

**Importance of School Attendance**

Nationwide, Balfanz and Byrnes (2012) estimated that within a given school year, between five and eight million students missed school on a regular basis, with many of these students missing more than 10% of the total number of days. Free and public education is one of the most positive aspects of our nation. Students, regardless of ethnicity, gender, country of origin, religion, and/or political status, are afforded the opportunity to receive an education free of charge in the United States. School attendance on a regular basis creates opportunities for students to not only receive an education, but assists with promoting growth, as well as assists with developing students into becoming productive citizens within society. When students are absent, they miss these learning opportunities within the framework of a given school day. Students are missing opportunities to receive instruction and interact with their teachers and peers (Finn, 1993; Lehr, Sinclar, & Christenson, 2004). Due to the fact that attendance is one of the key academic predictors of success in school, five to eight million students missing school on a regular basis emphasizes the need for further research. Since past research linked attendance and academic achievement, research must now delve deeper into the

4

analysis of individual student attendance and achievement data within confines of different school settings and demographically diverse students (Caldas, 1993; Gottfried, 2010; Roby, 2004; Sheldon, 2007).

Researchers linked increased school attendance with benefits for all students, but attendance is particularly important for historically underperforming groups of students in the United States (Balfanz & Byrnes, 2012; Bohrnstedt, Kitmitto, Ogut, Sherman, & Chan, 2015; Haycock, 2001). Special education students, economically disadvantaged (ED) students, English Language Learners (ELLs), and students of color benefited the most from increased school attendance (Balfanz & Byrnes, 2012). Federal and state governmental agencies created policies to require schools to close the achievement gap for these students (Bohrnstedt, Kitmitto, Ogut, Sherman, & Chan, 2015; Haycock, 2001). Attending school is the first step in closing the achievement gap of historically underperforming groups of students in the United States. Commenting specifically on economically disadvantaged students, Balfanz and Byrnes (2012) stated, "…one of the most effective strategies for providing pathways out of poverty is to do what it takes to get these students in school every day" (p. 4).

Absenteeism is shown to be related to student misbehavior (Eaton, Brener & Kann, 2008). Balfanz and Byrnes (2013) commented that absenteeism is one of the first indicators in predicting student disciplinary issues. Students, who are absent from school, oftentimes disengage from the learning process and more likely to engage in risky behaviors, such as alcohol and/or drug use (Guttmacher, Weitzman, Kapadia, & Weinberg, 2002; Hallfors, Vevea, Iritani, Cho, Khatapoush, & Saxe, 2002; Henry, 2007). A dangerous cycle of missed school, disengagement from the learning process, and risky

behavior can take place and spiral out of control (Appleton, Christenson, Kim, & Reschly, 2006; Klem & Connel, 2004; McNeely, Nonnemaker, & Blum,2002).

Critics of public education may cite research that calls for teachers to become change agents to encourage student attendance (Adelman; 2006; Fullan, 1993). However, even the best teachers, along with the interventions and the classroom instruction which may be provided by teachers, tend to become meaningless if students are not present to benefit from them. It is crucial that children attend school to receive the instruction from their teachers and to participate in the learning process (Balfanz & Byrnes, 2013). The National Forum on Education Statistics highlighted the importance of student attendance:

> Every school day counts in a student's life. While research substantiates the importance of teacher effectiveness on student academic success, even the best teacher cannot be effective unless students are present in class. Regular attendance is essential to providing students with opportunities to learn, and these opportunities are limited when students do not attend school. (2009, p.v)

### Link between Attendance and Achievement

Students, who are frequently absent, are more likely to have lower test scores and are less likely to graduate from high school than those students who attend school on a regular basis, indicating the negative relationship between attendance and achievement compound as students increase through grade levels (Barrington & Hendricks, 1989; Chen & Stevenson, 1995; Connell, Spencer, & Aber, 1994; Finn, 1993; Robins & Radcliff, 1998). Students in New York City (NYC) public schools were twice as likely to fail the state assessments when they missed more than 20 school days a year (Balfanz &

Byrnes, 2013). In a separate analysis of NYC public school students, students were twice as likely to receive a passing score on assessments compared to their peers who missed a month or more of school (NYC Independent Budget Office, 2011). In addition, there has been a significant negative correlation between grade point average and number of days absent from school across all grades (National Forum on Education Statistics (NCES, 2009). Attendance and achievement are an intertwined cycle of missed school and corresponding lower academic achievement that can begin as early as kindergarten for many students (Chang & Romero, 2008; Attendance Works, 2014). With absenteeism and lowered achievement cycling, students' prior attendance and achievement data become driving forces as students move through their school career (Silvestri, 2003; Credé, Roch & Kiesczynka, 2010; Gottfried, 2010; Attendance Works, 2014).

**Achievement and Excused Absences versus Unexcused Absences**

There is a clear link between the benefits of school attendance and achievement (Balfanz & Byrnes, 2013; Ginsberg, Jordan, & Chang, 2014; Roby, 2004). In an effort to encourage student attendance at school, schools enforce attendance policies (U.S. Department of Education, 2016). Realizing that some absences were out of a student's control, such as medical appointments or court appearances, schools excused these absences. When absences were not approved, schools enforced negative consequences for students missing school without either a valid reason and/or without the necessary documentation.

Excused and unexcused absences carry different consequences for students, but both types of absences result in missed school. Gottfried (2009) found a positive correlation between a higher number of excused absences and reading and mathematics

scores on standardized tests, whereas the opposite trend was true for students with a higher number of unexcused absences. Gottfried also found a negative correlation for students with a higher number of unexcused absences, compared to excused absences, and scores on standardized reading and mathematics assessments.  Also concluded was that the absence type was an indicator of events in a student's life. Excused absences required planning and documentation.  Highly motivated students may have excused absences, due to factors out of their control, but still returned to school and made up missed work.  However, unexcused absences were an intentional absence without documentation, indicating that some students lacked academic engagement and did not wish to attend school.   Finlay (2006) also discovered the same trend between excused and unexcused absences and student achievement.  She noted that students with a higher proportion of unexcused absences had significantly lower grades in reading and mathematics, as well as more out of school suspensions.

## Use of Attendance Policies

School officials realize that attendance matters and that coming to school is the first step to increasing academic achievement (U.S. Department of Education, 2016).  In the age of increased accountability for schools, school officials monitor attendance more closely than ever before (Attendance Works, 2016).  School officials establish attendance policies and systems for tracking and coding student attendance (Pennsylvania Department of Education [PDE], 2015b).  Students can be absent from school for a plethora of reasons.  Illness, the need to care for younger siblings, fear of bullying, unsafe situations, or lack of parental value in education can hinder a student's ability to attend

school.   School districts establish attendance policies that outline what constitutes an excused versus an unexcused absence (PDE, 2015b).

Attendance policies vary from state to state.  In Pennsylvania, for example, the state provides a system for assisting school districts regarding attendance policies and the possible legal ramifications if parents do not send their children to school (PDE, 2015b). If a student violates a prescribed number of absences, negative consequences may be enforced by the school district in which the student attends. Typically, local laws dictate a given school district's discretionary measures pertaining to the number of permissible, unexcused absences. Individual school boards determine attendance policies and their accompanying consequences.

The most common studies on school attendance examined aggregated attendance and achievement data, as opposed to, individual student data.  Research, that utilized aggregated data sets, showed that there is a positive correlation between attendance and achievement (Lamdin, 1996). Caldas (1993) discovered that attendance was a significant positive indicator of test scores in elementary and secondary school.  In addition, Roby (2004) and Sheldon (2007) utilized Ohio public school data to analyze attendance and achievement, and they also found higher grade level averages of student yearly attendance was positively correlated with higher reading achievement.   Although a clear link between higher attendance and higher academic achievement exits, these studies examined aggregated school data. A more detailed analysis of individual student data did not occur.

These aggregated attendance data can mask attendance issues.  A whole- school average of 90% daily attendance appears high, but this percentage not only fails to

recognize those students who are consistently absent, but it fails to delve into the root of the problem with said students' attendance. Reasons behind the absences and types of absences are not revealed by the average daily attendance. Ninety percent average daily attendance reveals very little about the attendance issues students are facing (Balfanz & Byrnes, 2013; Youth Justice Board, 2013).

**Hours Missed Due to Absenteeism**

To emphasize the hours missed due to absenteeism, Roby (2004) calculated the number of instructional hours lost. Even at 99% daily attendance rate for 400 students during a school year of 180 days, there were still 3,600 hours of instruction lost−3,600 hours of instruction that many students did not regain. As indicated by Table 1, in school with a larger number of students, similar to the research site utilized in the present study, 99% daily attendance for 3,000 students results in 32,400 hours of lost instruction. A critical task of the administration involves tracking which students missed these hours and discovering the reasons for those absences. Then a strategy must be attempted to address the student's issues and encourage him or her to improve attendance. Three thousand six hundred hours lost, divided by 400 students, is only nine hours of missed instruction per student per year. This does not seem like a lot of hours in the scope of a school year, but not all students miss an equal number of days or hours from school. Students who are chronically absent may miss the majority of hours, thus indicating the need for further investigation into individual student attendance data to examine which students are missing the majority of instructional hours.

Table 1

*Annual Attendance Averages: Instructional Time Loss (example: School housing 3000 students, 6 hours per instructional day, 180 academic days a year)*

| Average Attendance Rate | Instructional Hours Per School Year | Instructional Hours of Absence Per School Year |
|---|---|---|
| 100 | 3,240,000 | 0 |
| 99 | 3,207,600 | 32,400 |
| 98 | 3,175,200 | 64,800 |
| 97 | 3,142,800 | 97,200 |
| 96 | 3,110,400 | 129,600 |
| 95 | 3,078,000 | 162,000 |
| 94 | 3,045,600 | 194,400 |
| 93 | 3,013,200 | 226,800 |
| 92 | 2,980,800 | 259,200 |
| 91 | 2,948,400 | 291,600 |
| 90 | 2,916,000 | 324,000 |
| 89 | 2,883,600 | 356,400 |
| 88 | 2,851,200 | 388,800 |
| 87 | 2,818,800 | 421,200 |
| 86 | 2,786,400 | 453,600 |
| 85 | 2,754,000 | 486,000 |

*Note.* Adapted from (Roby, 2004)

Since aggregated school attendance data can mask attendance problems, there is a need for deeper investigation by researching individual student attendance data. Balfanz, Durham, and Plank (2008), in an analysis of yearly averages of individual student attendance data, found that over seven years of middle and high school, the top 20% of students missed an average of three days a year, and the bottom 20% missed an average of 28 school days a year. Gottfried (2009; 2010) addressed the issue of aggregated attendance analysis by examining individual student attendance data from kindergarten through 8th grade – a study that shed light on attendance and achievement issues once masked by aggregated attendance and achievement data. In addition, Coutts (1998)

suggested attendance be monitored weekly since high attendance rates are characteristics of effective schools.

Researchers recommend schools should employ incentives to encourage students to attend school (Attendance Works, 2016). However, stakeholders are aware that reasons for some student absences are out of the school's control and will not change by enforcing new policies (Roby, 2004). Schools must effectively employ interventions for students who are frequently absent as well as investigate the reason for these absences. It is also important to ensure that schools are collecting high-quality, historical attendance data that includes detailed reasons for student absences. As prior research indicated, negative effects of absenteeism begin as early as kindergarten and compound as students move through their academic career with a cycle of missed school and learning driving their academic achievement (Silvestri, 2003; Credé, Roch & Kiesczynka, 2010; Attendance Works, 2014). Absenteeism is a multifaceted problem that requires analysis of the relationship between individual student attendance and achievement data, and the polices that schools employ to address issues of absenteeism (Chang & Romero, 2008; Gottfried, 2009;2010; Balfanz & Byrnes, 2012; Attendance Works, 2014).

## Statement of the Problem

Research demonstrated the negative link between absenteeism and students' academic achievement which can not only begin as early as kindergarten but may continue to produce a negative relationship with student achievement though high school (Dekalb, 1999; Johnston, 2000; King, 2000; National Forum on Education Statistics, 2009, Attendance Works, 2014). These negative outcomes are particularly harmful for students of color, special education students, economically disadvantaged students, and

English Language Learners (Balfanz & Byrnes, 2012).  Recognizing the link between daily school attendance and student achievement, school districts created attendance policies, with accompanying consequences, to enforce daily attendance.  Educational researchers do not agree on the number of days students can miss from school without harming their academic achievement, which accounts for the reason that attendance policies vary in the number of days students can miss without the enforcement of negative consequences (Allensworth & Easton, 2007; Finlay, 2006; Ginsberg, Jordan, & Chang, 2014; Hixon, 2012; NCES, 2009a).  In addition, much of this research analyzed aggregated school attendance and achievement data, which can mask problems in schools by only looking at the group as a whole (Gottfried, 2009; 2010). Due to the past research indicating the relationship between attendance and achievement and the fact that the problem of student attendance is not eradicated, current research must delve deeper into the analysis of individual student attendance data.   There is a need for further educational research investigating the link between individual student class period absences, prior achievement, attendance policies, and individual student academic achievement. Research in these areas will allow school staff to identify if relationships exist between absences, past and current achievement, and if attendance policies are an effective deterrent to absenteeism. .

## Purpose of the Study

The need for further educational research in the areas of attendance and achievement calls for the collection of individual student data.  Specifically, in high school, students attend various courses throughout the day.  Students can come to school late and miss one class, but be present for their courses the rest of the school day.  This

indicates the need to examine individual student attendance data by class period, as it may vary throughout the day. The purpose of this quantitative study is to examine the relationship between absenteeism and Keystone Literature Exam scores, the state mandated exams for high school students in Pennsylvania. Prior to assessment, each Keystone Exam has a corresponding course. The study examined the relationship between test scores and individual student attendance data during the semester in which they are taking a Keystone course (English II) and their corresponding Keystone Exam score at the end of the course. This study also investigated the relationship between an attendance policy and Keystone Literature Exam scores.

## Research Questions

1) Is there a relationship between the number of semester English class period absences and Keystone Literature Exam scores? The sub-questions were as follows:

   a) Is there a relationship between the total number of excused and unexcused semester English class period absences and Keystone Literature Exam scores?

   b) Is there a relationship between excused semester English class period absences and Keystone Literature Exam scores?

   c) Is there a relationship between unexcused semester English class period absences and Keystone Literature Exam scores?

   i) Does that relationship differ for students who attend the STEM building versus the college prep/career and tech prep buildings?

ii) Does that relationship differ for students who are ethnic minorities versus the

White students?

iii) Does that relationship differ for students who have an IEP versus those who do

not have an IEP?

iv) Does that relationship differ for students who are ELL versus those who are not

ELL?

v) Does that relationship differ for students who are ED versus those who are not ED?

vi) Does that relationship differ for students after controlling for prior achievement?

2) Is the relationship between unexcused English class period absences and Keystone

Literature Exam scores different for students who violate the attendance policy (eight or

more unexcused English class period absences per quarter) versus those who do not

violate the attendance policy?

**Definition of Terms**

*Absenteeism-* the number of days students are not present in school.

*Aggregated Attendance Data-* For the purposes of the study, aggregated

attendance data will refer to whole school averages of daily or yearly attendance rates.

*Attendance Policy-* policy outlining the specific requirements for student's

attendance throughout a school year.

*Disaggregated Attendance Data-* For the purposes of the study, disaggregated

attendance data will refer to whole school averages of daily or yearly attendance rates

broken down into various groupings

*Excused absence-* when a student is absent from school, with an acceptable excuse as explained by an attendance policy, usually this type of absence does not carry any negative consequence.

*Individual Attendance Data-* For the purposes of the study, individual student attendance data will refer to the number of student absences per class period, school day or school year

*Instructional Time-* 990 hours of instruction per secondary school per year (PDE, 2016b).

*Student Achievement-* student level of attainment on Keystone Literature Exams; students can earn a below basic, basic, proficient or advanced rating. A passing score is proficient and numerically represents a score of 1500 (PDE, 2015a).

*Unexcused absence-* when a student is absent from school, without an acceptable excuse as explained by an attendance policy, usually this type of absence deems a negative consequence.

## Significance of the Study

This study sought to contribute to the educational research related to the analysis of the link between individual student class period attendance, prior achievement and achievement in a high school setting.  Specifically, the study examined individual student attendance in a specific course prior to state assessment of the content of that course. The study analyzed the relationship between the number of days absent and the state assessment scores as well as the relationship between prior 8th grade achievement, an attendance policy and the state assessment scores.  In doing so, this study sought to provide a model for school districts to examine if there is a link between their attendance

policies and student achievement, by providing detailed analysis of individual student attendance data.

## Summary

Achievement and attendance are positively correlated (Gottfried, 2009; Lamdin, 1996). From a self-explanatory standpoint, students must be present in school for learning to not only take place but for positive academic gains to occur. Students who are frequently absent from school receive fewer hours of instruction and are more susceptible to poor academic achievement (Chen & Stevenson, 1995; Connell, Spencer, & Aber, 1994). School attendance is a significant, positive indicator of high academic achievement in all grade levels (Caldas, 1993; Roby, 2004; Sheldon, 2007). As students miss school, they are also more susceptible to dropping out of high school as well as being more susceptible to misbehavior (Finn, 1993; Lehr, Sinclar & Christenson, 2004). Negative effects of absenteeism begin in early grades and compound as students move through their academic career with a cycle of missed school and learning driving their academic achievement (Silvestri, 2003; Credé, Roch & Kiesczynka, 2010; Attendance Works, 2014).

State and local policies exist to encourage attendance and to help prevent absenteeism. School district policies vary in regards to not only the acceptable number of days that may be missed, but in regards to the definitions used for excused and unexcused absences. Regardless of the type of absence, students are missing instruction. Students of color, special education students. English language learners, and economically disadvantaged students tend to take the hardest hit when it comes to educational performance. Researchers (Balfanz & Byrnes, 2013; Gottfried, 2009; 2010; Youth

Justice Board, 2013) recommend that schools monitor individual student daily attendance, not just aggregated student attendance data. Aggregated student attendance data is often presented in the form of a whole school average for daily attendance. These averages can actually mask attendance problems under the guise of assuming that a high average means most students are in school. Gottfried (2009) and Finaly (2006) pointed out the importance of determining if students were missing more excused versus unexcused absences due to the fact that unexcused absences were correlated with lower academic achievement.

This study addressed the first hurdle in combating student absenteeism by expanding beyond aggregated attendance data and delving deeper into individual student attendance data by examining the relationship between the number of class period absences, prior and current achievement. In addition, this study also examined the link between attendance, achievement, and the relationship of the school district's attendance policy. Once schools examine whether there is a relationship between a particular number of days absent and student achievement, an investigation concerning the specific obstacles preventing students from attending school should be secondary. The next chapter will describe the absenteeism problem in more detail and will include a review of the empirical and theoretical literature.

**CHAPTER 2**

**Literature Review**

The need for further educational research in the areas of attendance and achievement calls for the collection of individual student data (Balfanz & Byrnes, 2013; Gottfried 2009; 2010; Youth Justice Board, 2013). The purpose of this study was to address this need by examining individual student attendance and achievement data in a single urban high school, comprised of three buildings, as well the relationship between their attendance policy and their achievement. This chapter will review the current literature in the area of student attendance and achievement.

Commenting on the value of free public education in the United States, Chang and Balfanz (2016) stated "…the promise of an equal opportunity to learn regardless of the circumstances or social class is a widely accepted civil right that binds us together as a nation" (p. 4). Unfortunately, not all students are taking advantage of this privilege of an education. Annually, more than 13% of the nation's children, 6.5 million to be exact, miss three or more weeks of school (Chang & Balfanz, 2016).

Research established a positive link between attendance and achievement for students who participate in a traditional school day for all grades and ages of students (Balfanz & Byrnes, 2013, Ginsberg, Jordan, & Chang, 2014; Roby, 2004). Students who attend a traditional school day with regular attendance have higher academic achievement. This trend of higher attendance and achievement was not just prevalent in kindergarten through 12th grade, but continued into college as well, indicating the importance and lasting effects of positive school attendance in early grades and the role of prior achievement as students move through grade levels (Credé, Roch, &

Kieszczynka, 2010; Silvestri, 2003). Attendance Works (2014), a national and state level

non-profit organization, commented on the profound effects of student absenteeism:

As early as pre-kindergarten, students who are chronically absent are less likely to

read proficiently by the end of 3rd grade and more likely to be retained in later

grades…The problems multiply for students who are chronically absent several

years in a row. By 6th grade, absenteeism is one of three early warning indicators

that influence whether students will graduate from high school. By 9th grade, it is

a better predictor of graduation than 8th grade test scores (p.1).

Historically, student attendance and achievement has been and continues to be

examined by whole school averages of daily attendance (Balfanz, Durham, & Plank,

2008; Gottfried, 2009; 2010). A 96% daily attendance rate appears to be high, but it fails

to explain who is not coming to school. Research calls upon schools to branch out

beyond aggregated data sets or whole school averages of daily attendance and to examine

individual attendance data (Attendance Works, 2016; NCES, 2009b). This research calls

for the collection of individual student attendance and achievement data, specifically in

high school, where students attend various courses in a day (Balfanz & Byrnes, 2013;

Gottfried, 2009; 2010; Youth Justice Board, 2013). Students can come to school late and

miss one class, but be present for their courses the rest of the school day. This indicates

the need to examine individual student attendance data by class period, as it may vary

throughout the day. In addition, schools enforce policies, as recommended by federal and

state governments (NCES, 2011), to encourage student attendance and differentiate

between excused and unexcused absences from school (Finaly, 2006; Gottfriend, 2009,

2010). The question remains if there is a difference in achievement between students with excused versus unexcused absences and the achievement of students who violate attendance policies versus those who do not.

## Attendance Policy

Further investigation of the literature is necessary to examine the relationship between absenteeism and student achievement and how schools analyze this data. This topic encompasses various elements including attendance policies, types of absences and factors that contribute to student absenteeism. Federal and state governments provide recommendations for attendance policies and how to deter student absenteeism (Attendance Works, 2016; U.S. Department of Education, 2016). In the state of Pennsylvania, it is then up to local school boards to take the information and guidance from the federal and state policies and create their own policies for student attendance (PDE, 2015a; 2016b). These policies differentiate between excused and unexcused absences and how many days are acceptable for students to miss from school. However, it is critical to review if these two types of absences and the number of absences have an effect on student achievement. Furthermore, the purpose of this study focuses on the relationship between attendance and achievement and an attendance policy and achievement. Despite the fact that the study does not focus on the detailed reasons students are absent from school, contributing factors to student absenteeism do warrant further research to explore all facets of student attendance and absenteeism. Each state in the United States has a unique system of education, while following the legislation from the federal government.

**Federal Policy**

The United States has compulsory attendance laws requiring students to attend school, making it illegal for students not to attend school in some form. Students have the option of traditional school, cyber school, charter school, private school, special education school, and home school. Minimally all states require students to attend school from the age of eight to 16 years of age, but some states require students to attend earlier and stay enrolled longer (NCES, 2011).

Beyond compulsory attendance laws, the federal government passed additional legislation to require states to further analyze and report student attendance and absenteeism data. In December of 2015, President Obama passed the Every Student Succeeds Act (ESSA) as part of the reauthorization of No Child Left Behind (NCLB) and the Elementary and Secondary Education Act (ESEA). The legislation specifically, for the first time, comments on absenteeism by requiring states to report on students missing more than 10% of the school year and by allotting federal funds on training to reduce absenteeism. This legislation addresses students who are chronically absent, noting the pattern of lower academic performance and a greater risk of dropping out of school (Chang & Balfanz, 2016). Specifically, the federal government provides states with the option of a waiver from the testing requirements of NCLB that would allow states to create their own means of assessment, ESSA indicators. The indicators must be applicable to every student, provide summary and disaggregated data (area of focus for absenteeism), be comparable across a state's school districts, be able to distinguish differences in performance among schools, be valid, be reliable, and have a proven impact on achievement. These accountability measures allow states to branch out beyond

measures of the past, such as graduation rates and state assessments. States can now focus on academic indicators of their choice, such as absenteeism (Attendance Works, 2016; U.S. Department of Education, 2016).

**State Policy (Pennsylvania)**

The state of Pennsylvania has 500 school districts governed by community elected boards of education.  Specifically in Pennsylvania, school boards follow federal and state attendance recommendations to create their own policies for their individual school districts. In the United States, every state has compulsory attendance laws requiring children to attend school.  Each state varies slightly in the age at which students must start school and are allowed to elect to end their schooling (Aud, Hussar, Kena, Bianco, Frohlich, Kemp, & Tahan, 2011).  In Pennsylvania, students are required to attend school from the ages of eight to 17, but every student can attend from the ages of five to 21 (PDE, 2016b).

The Pennsylvania Department of Education and their Truancy Taskforce requires that all school districts consider any absence unexcused until written notification is provided about the reason for the absence.  PDE broadly defined excused absences and allows for school districts to further define what constitutes an excused versus an unexcused absence.  After ten unexcused absences, schools are to drop students from the active rolls.  School districts are required to hire at least one attendance officer to oversee attendance in the school district (PDE, 2015b).

PDE recommends that schools immediately inform parents when their students are absent without an excuse.  PDE requires schools to establish a truancy elimination plan for a student who misses more than three days unexcused, which is a collaborative

23

effort between the school, the student, and the parents about a way to ensure that their child attends school.  If students continue to miss school without excuse, Children and Youth Services may be involved as well as the local magistrate.  The magistrate can fine students and parents up to $300 plus court expenses for continually missing school without a valid excuse, as well as imposing parental education programs on parents, and community service on students.  Students can also have their driving privileges suspended (PDE, 2016b).

PDE requires all school districts to follow their recommendations for student attendance.  School districts may also elaborate on these recommendations and establish student attendance policies and consequences for missed school that affects students' course grades.  These policies are separate from the policies established by PDE.  Even if students are required to fail a portion of their grade due to missed school, school districts are still required to follow guidelines for parental notification, formation of a truancy elimination plan, and the involvement of Children and Youth services and the magistrate (PDE 2015b; 2016b).

## Absence Type

Absences from school occur for a plethora of reasons. Attendance policies account for this by distinguishing between excused and unexcused absences (NCES, 2011).  These policies typically enforce negative consequences for exceeding a predetermined number of unexcused absences.  In addition, these policies allow an unlimited number of excused absences due to the nature of the reason for the absence.  Each school district determines what constitutes an excused absence.  Typically, things

such as illness or medical appointments with a note from a doctor, funerals, and court appearances are excused absences (PDE, 2015b; 2016b).

Differentiating between excused and unexcused absences is crucial due to the reasons and motivation behind the student absences. Gottfried (2009) commented that often students with more unexcused absences are disengaged from school, which is why they miss school without a valid excuse or reason and many times lack parental support at home. The opposite is often true for students with high numbers of excused absences. Jonasson (2011) indicated that students may be highly motivated to learn and make up the work they missed when an absence is documented and excused because the student had a legitimate reason for the absence.

Many times unexcused absences carry negative consequences that are enforced and monitored by school officials. For this reason, schools often focus on the unexcused absences, but fail to examine the effect of excused absences on student performance; both types of absences equate to missed time in school. Research recommends examining the effects of both types of absences (Chang & Romero, 2008; Finlay, 2006; Gottfried, 2009).

**Excused Absence**

Although excused absences do not carry a penalty with proper documentation, students are still absent from the learning process. The question arises as to whether these absences are detrimental to student learning because students are still absent even though the absence is permissible. There is little educational research in the areas of excused absences due to the fact that schools "allow" students to miss school for reasons they deem excused (Finlay, 2006).

Finlay (2006), noting the gap in the educational research on the effect of excused and unexcused absences, targeted 780 students, with excessive absences, in grades pre-kindergarten to 5th grade, with the goal of exploring the academic and disciplinary differences among students with both types of absences. For the purposes of this particular study, excessive absences were defined as having more than five absences (of each type) in a month long period or 10 or more in a 90 day period. Of the students in the sample, the majority of the students in the study were in kindergarten and 1st grade representing 26.8% and 19.2% respectively of the study sample. Seventy-four percent of the students received free and reduced lunch. Students with excessive excused absences outperformed their peers with excessive unexcused absences. Students with excessive excused absences had an average reading grade of C. Students with excessive excused absences were promoted more than their peers with excessive unexcused absences. Eighty-five percent of students were promoted to the next grade. In addition, students, who were classified as special education, had significantly more excused absences than students who did not carry this status. Gershenson (2017), in a similar study of students in Kindergarten and 1st grade and 4th and 5th grade, also discovered that excused absences caused less harm than unexcused absences on student achievement in North Carolina public schools.

Gottfried (2009) also addressed this issue by examining the effect of excused absences on student achievement in 2nd and 4th grades in a six year longitudinal study in the city of Philadelphia. Citing the long term effects and the continued pattern of missed school when students are absent in elementary school, Gottfried focused on elementary school students. He found that students with a higher number of excused absences

compared to their total number of absences had higher reading test scores.   Clement

(2006) found similar results in an analysis of the Florida Comprehensive Assessment

Test.  High unexcused absences were associated with lower scores and there was no

significant relationship between the assessment scores and excused absences.

**Unexcused Absence**

Research has shown that excused absences do not carry as many detrimental

effects to a student's academic performance.  Research has cited the opposite is true for

students with unexcused absences; excused absences tend to decrease as unexcused

absences tend to increase (Gottfried, 2009).  As unexcused absences increased, student

grades and performance lowered on standardized tests (Clement, 2006; Finlay, 2006;

Gottfried, 2009).  Also, higher unexcused absences are associated with school

disengagement, behavior problems, and/or delinquent behavior, which further indicates

the need to examine absence type separately because students with more unexcused

absences may have many dangerous factors contributing to the absence (Gottfied, 2009;

Hess, Lyons, Corsino, & Wells, 1989; Rumberger, 1995).

The aforementioned studies completed by Finlay (2006) and Gottfried (2009)

focusing on excused absences also focused on unexcused absences.  Finlay (2006) found

that students with excessive unexcused absences had significantly lower grades in

reading and mathematics with average grades of C- than their peers with excessive

excused absences. The majority of students, 82% in reading, with unexcused absences,

had grades of C, D, and F. Students with excessive unexcused absences were also

promoted less to the next grade with 62% of students being promoted.  In addition, 19%

of students with excessive unexcused absences were significantly more likely to be

suspended out of school, and 23% had discipline referrals. In addition, students, who received free and reduced lunch, had significantly more unexcused absences. This study, however, did not provide baseline information for students without excessive absences as comparison data.

In the longitudinal study completed by Gottfried (2009), he found that students, with a higher proportion of unexcused absences, were academically at risk. Student standardized testing performance is negatively affected by a higher proportion of unexcused absences. These unexcused absences were also associated with risk factors such as poor and delinquent behavior and school disengagement. Specifically in elementary school, unexcused absences were indicative of a negative home environment.

The effect of unexcused absences is more detrimental to a students' academic performance than excused absences, even though an excused and unexcused day absent equal the same amount of missed learning time. In 8th grade, students had on average the same amount of unexcused and excused absences, but the number of unexcused absences tripled in 9th grade where as the number of excused absences stayed the same (Rosenkranz, De la Torre, Stevens, & Allensworth, 2014). Finlay (2006) commented, "Students with excused absences do not manifest the similar negative outcomes in academia or discipline compared to students with unexcused absences" (p.4). This can lead one to speculate that the reasons behind the unexcused absences have an effect on the student which then in turn affects their academic performance. For example, Sheldon (2007) found that a higher proportion of excused absences was indicative of a more positive relationship among the student, the parents, and the school. A higher number of unexcused absences can indicate that parents are not as involved in their child's

education (Gottfried, 2009; Jeynes, 2005), and many of these parents believe there is a lack of communication and trust between them and the school (Davies & Lee, 2006).  In addition, students with more unexcused absences have been proven to have lower motivation towards academic work (Eaton, Brener, & Kann, 2008) and are less engaged in the learning process (Lehr, Sinclair, & Christenson, 2004).

## Contributing Factors to Missed School

Student absenteeism is a multifaceted problem that cannot be examined from just one angle.  Student absenteeism is comprised of many variables contributing to whether or not students attend school, such as school, community and family level factors, and health and behavioral issues (Balfanz & Byrnes, 2012; Henry, 2007; Youth Justice Board, 2013).  While the purpose of the current study is to examine solely individual student attendance and achievement data, it is important to acknowledge the influence of school, community, family and behavioral factors on student absenteeism.

### School

Although student attendance is at the forefront of education and schools have the main goal of increasing student attendance, schools can actually deter students from attending.   Intentional or not, school policies, teachers and staff, and facilities can have a negative effect on students.  Many times students may perceive teachers' and staffs' actions in a negative manner and not want to attend school because of avoidance of a particular staff member or teacher.  The enforcement of policies may also deter students, and some may feel policies are unfairly targeting them.   Students cited a dislike of school as one of the top three main reasons for skipping school and further explained that unfair rule enforcement and lack of relationships with their teachers encouraged them to

skip school (Wilkins, 2008). Schools can intentionally exclude students from the learning process by suspending them from school. Students with more out of school suspensions were found to have lower performance, specifically in the state of Indiana (Rausch & Skiba, 2004), and a decline in reading proficiency as the number of suspensions increased, which typically occurs in middle school (Arcia, 2006). Additionally, poor school facilities can also deter students from attending school (Youth Justice Board, 2013).

**Community**

The community in which a student lives can have an effect on the likelihood of school attendance. Location and safety of a student's home and neighborhood as well as the community attitudes and values towards education all play a role in the formation of a student's attitudes, opinions, and motivation to attend school and perform. Gottfried (2010), in the city of Philadelphia, found that the distance a student lived from school was correlated with school attendance. The further elementary and middle school students lived from school made them statistically less likely to attend school. This study only included elementary and middle school students, not high school students.

When students live in poverty stricken neighborhoods that are severely distressed and many families experience intergenerational poverty, students often lack positive role models who see the value of an education that would encourage them to attend school. In addition, many of these neighborhoods are violent with crime and gang activity that make the journey to school unsafe, and once again the children may lack the role models in the community to make school attendance an attractive and achievable ideal (Chang &

Romero, 2008).  In addition, bullying and harassment in school or the local community

can also hinder a student's ability to attend school (Balfanz & Byrnes, 2012).

**Family**

Henry (2007) commented that even though schools have the ability to positively

influence student attendance, it is typically the job of parents/ guardians to ensure that

their students attend school on a regular basis.  Family structure can be indicative of a

student's rate of attendance.  Researchers have found that students from single parent

homes often struggle more to attend school (De Vos, 2001; Gottfried, 2014; Henry 2007).

Family issues and work schedules often hinder a student's ability to attend school.

Students, especially in high school, frequently are responsible for younger siblings, work

part or full time jobs to support their families, and/or have children of their own.

Sometimes parents allow students to be absent from school for reasons that are

not excused, such as caring for younger siblings (Sparks, 2011).  Demands imposed by

low socioeconomic status and the pressure to provide for their families can also serve as a

deterrent to parental interest in school (Chang & Romero, 2008). In addition, parents may

have little knowledge of the school system and procedures and not fully understand the

magnitude of their child's absenteeism.   Assumptions may be formed about single

parents or students living in poverty, however their parents do care, but do not always

have the means to support their children in all the ways necessary to guarantee success in

school (Chang & Romero, 2008).

**Health and Behavior**

Student illness seems to be the most commonly associated reason for student

absenteeism (Lochmiller, 2013).  Asthma is the leading health issue affecting student

absences (Kearney, 2008). Attendance and illness can be exacerbated when students are chronically ill or lack health insurance for proper medical care. Balfanz and Byrnes (2006) commented that less than 6% of children miss more than 11 days of school due to illness, which indicates that there are many other factors contributing to students missing school.

Students who are frequently absent from school are also at a higher risk of engaging in unhealthy and inappropriate behaviors (Eaton, Brener, & Kann, 2008). This increased risk was documented as early as the 1970s (Brook, Lukoff, & Whiteman, 1977; Galli, 1974) up until the present time (Guttmacher, Weitzman, Kapadia, & Weinberg, 2002; Hallfors, Vevea, Iritani, Cho, Khatapoush, & Saxe, 2002). Negative effects of absenteeism can be felt as early as kindergarten. Students who miss more than 10% of the school year are not only behind academically, but lack the social skills to be successful in school, such as ability to pay attention and work independently (Gottfried, 2014).

**Elementary and Middle School Attendance Patterns**

The focus of the current study is high school students, but unfortunately most attendance problems begin at an earlier grade level and have lasting effects on a student's education and academic performance. This indicates the need for examination of the role of prior achievement in the relationship between individual student attendance and achievement data in high school. Gottfried (2014) found that 13% of kindergarteners missed more than 10 % of the school year with 10 % of those students missing 11 to 19 days and 3% missing more than 20 days. Students are less likely to be at grade level reading by 3ʳᵈ grade if they are chronically absent as early as pre-kindergarten (Connolly & Olsen, 2012; Ehrlich, Gwynne, Stitziel Pareja, Allensworth, Moore, Jagesic, & Sorice,

2014). These same students are also less likely to develop the social skills needed to persist in school (Gottfried, 2014). By 6th grade, absenteeism is a key indicator of student dropout rates in high school (Balfanz, Herzog, & MacIver, 2007). Even when students who are frequently absent throughout their schooling succeed and graduate, they are less likely to continue their education beyond high school (Allensworth & Easton, 2007).

Railsback (2004) found an increase in unexcused absences in middle school. Unexcused absences increased by 6%, from 13% to 19% of the student population, from the beginning of middle school until the end of 8th grade (Henry, 2007; Veenstra, Lindenberg, Tinga, & Ormel, 2011). In addition, 10% of 8th grade students reported skipping school at least once in a one month period. A high proportion of these students were failing classes, were from single parent homes, worked a job outside of school, and placed little importance on high school graduation (Henry, 2007). These studies indicate the importance of not analyzing the many facets and variables of attendance in isolation.

These aforementioned studies indicate the importance of establishing positive school behaviors before high school. In addition, high schools must also examine elementary and middle school attendance patterns and levels of achievement to help identify students at risk of attendance problems early in high school (Chang & Romero, 2008). The compilation of failing courses in school is the number one contributing factor to students dropping out of high school. Failing grades can cause students to disengage from the learning process and not attend school regularly. Absenteeism is a significant contributing factor to students wanting to drop out of school (Featherston III, 2010; Suh & Suh, 2007). High school transition is a huge concern for students at risk of dropping out (Balfanz & Legters, 2006). This further indicates the importance for high

schools to analyze elementary and middle school trends in attendance and achievement

to provide students the necessary supports to succeed and graduate from high school.

## Attendance and Achievement

Schools rely on the principle that students who attend school on a regular basis

perform better, and their policies for attendance and absenteeism center around this core

idea. Generally speaking about a traditional school day, students who attend school have

better grades (Guare & Cooper, 2003; Roby, 2004). The inverse is true about students

who do not attend school; the larger number of days absent was correlated with a lower

grade point average (NCES, 2009b). These findings were consistent regardless of

absence type. The same negative correlation was found for standardized test scores and

absenteeism, as the number of days increased scores decreased (NCES, 2009b; Neild &

Balfanz, 2006). Gottfried (2010) emphasized the significance of the correlation between

attendance and grade point averages and standardized test scores. This shows the impact

of student absenteeism across multiple measures of student performance. In addition, in

a longitudinal study of students in grades kindergarten through 8th grade, Gottfried found

a positive correlation between attendance and achievement across all grade levels,

subjects and achievement measures.

**Link between Absenteeism and Achievement: Aggregated Data Analysis**

In general, schools with higher averages of yearly attendance perform better on

standardized tests (Caldas, 1993; Roby, 2004; Sheldon, 2007). Specifically, Roby (2004)

examined the relationship between attendance and achievement in Ohio Public schools

using aggregated school data. There was a statistically significant relationship between

student attendance and achievement in grades 4, 6, and 12. There was a moderate to

strong correlation in 9th grade. In addition, schools with the top 10% of scores on proficiency tests had higher averages of attendance than schools with the lowest 10% of scores on proficiency tests. Sheldon (2007), using Ohio Public School data as well, found that increased attendance also increased reading and mathematics achievement.  In addition, Caldas (1993), also examining elementary and secondary public school data, found a positive correlation between higher attendance and achievement.

The aforementioned studies tell the reader about what is happening as a whole school. The fact remains that in order to help students and improve schools, a one size fits all approach is not necessarily appropriate or effective.  The danger in only analyzing research like the studies above is that it only tells the reader surface level data.  Schools need to probe further and deeper into student level data to be able to get to the root of the problem and improve student level performance.

**Link between Absenteeism and Achievement: Individual Student Data Analysis**

As mentioned in prior studies, whole school averages of attendance and achievement data provide surface level data analysis without delving deeper into the students who are struggling and the reasons behind their struggle (Chang & Romero, 2008). Schools may appear to be highly successful, but by only examining aggregated data, or whole school averages of daily and yearly attendance, they are missing those students who are struggling, masked by what appears to be high averages of attendance and performance. Individual student data analysis allows for a more accurate picture of what the data is truly telling schools about student performance and it can be broken down to identify individual students and their academic needs.

35

In an analysis of 9th grade students, higher absences were associated with lower academic achievement and poorer classroom behaviors (Monk & Ibrahim, 1984). Echoing these results, Balfanz and Byrnes (2012) found that, after controlling for demographic variables and special education and English as a second language status, 9th grade achievement decreased with each absence. Ginsberg, Jordan and Chang (2014) in analysis of 2013 National Assessment of Educational Progress (NAEP) data found that, in a sample of 4th and 8th grades from all 50 states, students who missed more than three days the month before the assessment scored lower than students who missed no school before the assessment. In 8th grade, students scored 13 points lower in reading. Goodman (2014) also found that absences negatively affected learning, but more so mathematics than reading which he explained by saying that mathematics is so heavily dependent on the prior lesson that teachers often take more time reviewing what absent students missed. This process then holds the other students back. Chang and Romero (2008) also found that in a national sample of kindergarten students, achievement decreased as absences increased in reading.

An additional analysis utilizing 8th grade data in Chicago Public Schools found that students scoring in the highest quartile on the Iowa Test of Basic Skills missed the least amount of school (Allensworth & Easton, 2007). A majority of these students missed only zero to four days while students scoring in the lowest quartile missed anywhere from five to nine and upward to 20 or more days (Allensworth & Easton, 2007). The same was found to be true for students in New York City; schools with the highest number of students missing more than 10% of the school year had the smallest number of students passing the Common Core Test in reading. Conversely, reading was

more affected by absences than mathematics in other students (Nauer, Mader, Robinson, & Jacobs, 2014). Balfanz and Byrnes (2013) evaluated the impact on students who improved their absenteeism when they were chronically absent in New York City. Students who increased their number of days present were less likely to score below basic on state administered assessments. Students saw improved academic gains after increasing attendance by two weeks.

Gottfried (2009, 2010, 2014), addressing the need for individual attendance analysis, completed three studies analyzing student data as pertaining to this nature. In 2009, Gottfried analyzed excused versus unexcused absences and determined that unexcused absences were more detrimental to student academic performance. Using a longitudinal data set of kindergarteners, specifically focusing on students who were chronically absent, Gottfried (2010) found students performed significantly worse than their peers. Gottfried (2014), building upon his work from 2010, further examined attendance in terms of chronic absenteeism and found that students lacked in both mathematics and in reading achievement, as well in social skills and school engagement, when missing more than 10% of the total number of days of the school year. In addition, through the analysis of longitudinal attendance and achievement data, Gottfried (2009, 2010, 2014) indicated that prior achievement is not just representative of the level of knowledge acquisition, but also a culmination of past attendance. The relationship between attendance and achievement is cyclical and drives students' achievement.

**Demographic Variables and Student Achievement**

When standardized testing occurs, the state or testing body identifies all demographic variables for the assessed students. Researchers have examined the links

37

between student achievement and demographic variables as well as the manner by which they affect student achievement. Some researchers examined variables in isolation; for example, comparing males versus females. Others compared variables together in order to determine which variables have the greatest impact on student achievement. Within any specific case, a given variable may have a more pronounced effect than another.

The socioeconomic status (SES) of a student, specifically students in poverty, is correlated to lower academic achievement (Chang & Romero, 2008; Chatterji, 2006; Dahl & Lochner, 2005). Considering that SES, which is commonly measured by free and reduced lunch status, is a powerful indicator of academic achievement (Sirin, 2005), as well as attendance and academic achievement (Gottfried 2009), it is important to examine the potential links among these three variables. Unfortunately, measuring SES by free and reduced lunch status alone narrows the true representation of SES. Sirin (2005), utilizing a meta-analysis, examined a number of variables that may be used to identify SES status, such as neighborhood characteristics, parental education and occupation, and family income. For the purposes of this study, SES is identified by the state of Pennsylvania, by free and reduced lunch status.

Poverty is not only closely associated with a gap in reading achievement, but it can be most commonly explained by a lack of access to reading materials in the home (Dahl & Lochner, 2005; Ready, 2010). Poverty continues to play a greater role in kindergarten reading achievement than that of gender and/or ethnicity. These gaps in achievement continue to widen as students approach both middle school and high school level (Chatterji, 2006). Students, who received free and reduced lunch, were 40% more likely to miss school the month before the NAEP assessment than those students who did

not receive free and reduced lunch. These same students scored almost seven points lower on the assessment (Ginsberg, Jordan, & Change, 2014). Goodman (2014) found that students of poverty missed three more days of school than their peers which, in turn, accounted for one-twentieth of lower achievement in reading.

There is very little difference between absences among males and females after controlling for demographic variables. Boys only missed one more day of school than girls (Allensworth & Easton, 2007). Balfanz and Byrnes (2006) also found that there was little difference between the attendance rates of males and females. Eighth grade female students being assessed with the NAEP, who were found to be frequently absent as opposed to those who were not frequently absent, tended to outperform their male counterparts on the reading assessment (Ginsberg, Jordan, & Chang, 2014).

Students of color, with the exception of Asian/Pacific islanders, scored lower than their White peers and missed more school before the NAEP assessment (Ginsberg, Jordan, & Chang, 2014). When comparing students with similar absences and studying habits, non-White students still fail more courses than White students and have lower GPAs and overall achievement on standardized tests with the exception of Asian students (Allensworth & Easton, 2007). Missing more than 10% of the school year in kindergarten had the greatest effect on Hispanic students as compared to Blacks and Whites. This statistic is significant because Hispanic students make up the largest proportion of students in our country (Chang & Romero, 2008). In addition, students of color may come from culturally and linguistically different backgrounds that may hinder the family's ability to understand the importance of school attendance (Chang & Romero, 2008).

Variables are interconnected and overlap.  As pertaining to the studies thus mentioned by Allensworth and Easton (2007), absences and studying habits were accounted for, and students of color still underperformed as compared to their white peers, which indicates that multiple variables affect students and their performance.  For example, poverty is a greater predictor of achievement among white students (Sirin, 2005).  Researchers surmised this because a higher proportion of minority students have other risk factors that diminish the effect of low SES.  Additionally, students with higher SES are more likely to attend better schools with newer facilities and less teacher turnover, which can all contribute to high academic achievement (Jimenez-Castellanos, 2010).   In Chicago Public Schools, after controlling for mobility, age entering high school, and elementary test scores, there was very little difference among gender, race, socioeconomic status, and student absences (Allensworth & Easton, 2007). In addition, students who are considered chronically absent individuals tend to not only come from families that are currently in poverty, but come from families that have been in poverty in an intergenerational manner (Allensworth & Easton, 2007).  The fact remains, many students may be listed under multiple variables, and the effects of these given variables may overlap and carry with the given students specific life experiences and/or situations that affect their learning and their overall performance in school.

**Number of Absences**

Little consensus exists on the number of allowed absences from school, but the effect of absences on achievement is clear.   In general, based on prior research, a lower number or no absences indicates higher academic achievement (Ginsberg, Jordan, & Chang, 2014; Roby, 2004).  As the number of days absent increases, both grades and

individual achievement decreases (NCES, 2009b). In Pennsylvania, each school district determines the number of allowed absences per their respective attendance policies and the negative consequences for exceeding those number of allowed absences When schools average 93.9% average daily attendance with an average of 180 days of school, one would assume that students are missing about 11 days on average per school year. Those 11 days are not divided evenly; some students may miss a total of zero days, whereas other students may miss many more than 11 days of school (Snyder & Dillow, 2014).

Students who did not miss any days before the assessment showed very little difference in their overall scores when compared with those students who missed at least one or two days. For example, in 8th grade reading, there was a two-point difference (Ginsberg, Jordan, & Chang, 2014). The difference in scores occurs when students are absent three or more days. In an additional analysis of NAEP exams, during the school years 2009 and 2013, it was discovered that students with three or more absences of any type were significantly less likely to score at or above the basic level when compared to their peers with no absences. (Ginsberg, Jordan, & Chang, 2014; NCES, 2009a).

The Georgia Department of Education (2011) found that five absences, both excused and unexcused, during the school year had a negative effect on student achievement. Hixon (2012), in a study of elementary school students, found that students with more than eight days of absences had significantly different scores than students with seven or fewer absences. In Baltimore, 6th grade students who missed fewer than ten days of school had a 70% chance of graduating on time (Baltimore Education Research Consortium (BERC), 2011). Similarly, in 9th grade, students who missed five

to nine days of school had a 63% chance of graduating, and students' chances dropped to 41% if they missed anywhere from 10-14 days. The likelihood of graduation was reduced significantly if students missed more than 14 days of school (Allensworth & Easton, 2007). Interestingly, although the study was completed in the college setting, Levine (1992) found that her course attendance policy did not have an effect on student achievement, but the number of student absences did. As they increased, achievement decreased. Specifically, in a semester long course, students with more than 3.6 absences failed the course.

Neild and Balfanz (2006) estimated that a 1% increase in attendance for an 8th grade student during the school year would reduce the student's chances of being retained in that grade by four percentage points as well as reduce that's student's chances of being retained in 9th grade by five percentage points. In addition, the Georgia Department of Education estimated that a five-day increase in attendance would allow 55,000 more students to pass state assessments in grades three through eight (Barge, 2011). Balfanz and Byrnes (2013) evaluated the impact of students entering and exiting chronic absenteeism and missing more than 20 days of school within the New York City School District setting. Students saw improved academic gains after increasing attendance by two weeks. Interestingly, Aucejo and Romano (2014) found that an absence in 5th grade was far more detrimental when compared to a day's absence in 3rd grade. A ten day increase in student attendance would increase student performance by 3% in reading as compared to a ten day extension of the school year which only increased achievement by 0.2% (Aucejo and Romano, 2014).

It is important to note that not all students with chronic absenteeism perform poorly. There are outliers to the research. Some students, possessing high academic ability, perform well in spite of missing school on a regular basis. In a study of Chicago Public Schools, almost half of the top achieving students on the Iowa Test of Basic Skills missed more than a week of school each semester. Although students are still performing well, absences indicate a loss of learning time, and if students attend school their performance could increase even more (Allensworth & Easton, 2007).

School officials, state boards of education, and researchers are able to collect attendance and achievement data with a variety of methods, whether they are from large longitudinal studies, whole school analyses, or merely from individual student performance. Many of the studies thus mentioned have focused merely on elementary school students, specifically kindergartners. The proposed research study, however, will analyze high school attendance data. However, the analysis of prior achievement data represents a culmination of students' attendance and achievement data, as attendance and achievement are cyclical (Gottfried 2009, 2010, 2014). Although there is a large gap in time and learning between kindergarten and ninth grade, studies have shown that students who display high absenteeism in elementary school tend not only to continue with the high absentee rates upon entering the high school realm, but the overall percentage of absences increases as the number of academic problems intensify (Lehr, Sinclar, & Christenson, 2004). Students were found to miss nearly three times as many school days in their 9th grade year as compared to when they were students in 8th grade (Rosenkranz, De la Torre, Stevens, & Allensworth, 2014). As absences, learning problems, and gaps in achievement increases, students are not only at a higher risk for dropping out, but many

43

face continual unemployment issues upon leaving school (Broadhurst, Patron, & May-Chahal, 2005; Kane, 2006). In summary, elementary data does, indeed, matter for high school research as it serves as a predictor for high schools to better plan for their students who are most at risk.

## Analysis of Attendance Data

The current trend associated with attendance and achievement data is to shift from the examination of whole school attendance and achievement data to the individual data analysis, backed by research studies (Finlay, 2006; Gottfried, 2009; 2010) and the federal government through the passing of the Every Student Succeeds Act (ESSA) (Attendance Works, 2016; U.S. Department of Education, 2016). Schools take daily attendance, but general attendance codes are not detailed enough to truly explain why a student is absent (NCES, 2009b). Coutts (1998) suggested attendance be monitored weekly since high attendance rates are characteristic of effective schools. Monitoring and tracking systems should allow for a more detailed analysis of chronic absenteeism as well as highlight students who may not only be at risk of failing courses but be at risk for dropping out of school (Eaton, Brener, & Kann, 2008; NCES, 2009b). These types of analyses may be accomplished by specifically analyzing individual student attendance data (Ginsberg, Jordan, & Chang, 2014) and delineating between excused and unexcused absences (Gottfried, 2009). Clear policies must be in place in order for data to be recorded in a student information management system in a manner that provides the data that teachers and school administrators need to analyze student attendance (NCES, 2009b).

The ESSA emphasizes the importance of disaggregated data analyses that come from valid and reliable data input. Specifically, states not only provide detailed analyses

of attendance data, but they place a high priority on monitoring and tracking attendance in order to provide an accurate picture of daily attendance rates in order to better discern the current trends in these absences (Attendance Works, 2016; U.S. Department of Education, 2016). Olson (2014) found that the attendance pattern in the month of September was a viable predictor of student attendance throughout the school year. For example, students who missed two to four days in September went on to miss an average of 25 days of school within the entire school year. In addition, students who missed only two or fewer days in September had a good attendance record throughout said school year. DeSocio, VanCura, Nelson, Hewitt, Kitzman, and Cole (2007) echoed the idea of early identification and indicated that addressing attendance during the first marking period is crucial for change. Research of this nature further indicates the need for detailed, individual student attendance data.

The involvement of community agencies (Featherston, 2010) and parents (Ginsberg, Jordan, & Chang, 2014) is key to shedding light on the negative effect of absenteeism as well as assisting in encouraging community and parental involvement in an effort to promote better school attendance rates for all students. Balfanz and Byrnes (2013) commented, "Much of this effort developed in response to the discovery that even among seasoned principals there is an assumption that attendance is largely about compliance, rather than improving performance outcomes, and that many were unaware of the level of chronic absenteeism at their schools" (p.14).

## Summary

Student absenteeism is a multi-layered problem. The issue of student absenteeism goes far beyond the basic need for getting students into a seat and into a classroom to

learn.  Many factors contribute to student absenteeism and hinder students' ability to

attend school.  School policies, suspensions, unsafe communities, bullying, illness,

poverty and delinquent behaviors can all form barriers to student attendance (Chang &

Romero, 2008; Eaton, Brener, & Kann, 2008; Henry, 2007; Kearney, 2008; Wilkins,

2008).  These issues can compound to affect student attendance as early as kindergarten,

and problems persist throughout high school (Allensworth & Easton, 2007; Gottfried,

2014).  Schools have been combating these issues for years, and, in 1999, absenteeism

was cited as one of the top 10 issues facing schools (DeKalb, 1999).  The problem is not

dissipating, and the President of the country addressed the issue through the authorization

of ESSA which includes indicators to allow schools to address absenteeism (U.S.

Department of Education, 2016).  The federal and state governments and local school

boards attempt to mitigate student absenteeism by providing policies that deter

absenteeism and encourage states to include truancy prevention as part of their

evaluations for state performance measures.

State and federal education agencies and local school boards base their policies

upon the research that students who attend school perform better.  Students who attend

school regularly have higher academic achievement and standardized testing

performance.  As student absences increase, student performance decreases.  A higher

number of absences is associated with lower achievement, and students with fewer than

three absences tend to perform better (Balfanz & Byrnes, 2013; Ginsberg, Jordan, &

Chang, 2014; Roby, 2004).  Local school boards distinguish between excused and

unexcused absences in an attempt to reduce the number of unnecessary absences.

Research has shown (Finaly, 2006; Gottfried, 2009) that unexcused absences are far more

detrimental to students' academic performance.  Often student absences are examined as whole school averages of attendance and achievement data, which mask individual student attendance and achievement issues (Caldas, 1993; Roby, 204; Sheldon, 2007). Recent studies in attendance and achievement examined individual student attendance and achievement data, which provides more detailed information about student absences and achievement (Balfanz & Byrnes, 2012; 2013; Chang & Romero, 2008; Ginsberg, Jordan, & Chang, 2014, Gottfried, 2009; 2010; 2014).

Although, the primary studies focusing on the effects of excused versus unexcused absences and many studies on individual student attendance and achievement data centered on elementary school students, prior research has proven that attendance patterns in elementary and middle schools continue into high school (Lehr, Sinclar, & Christenson, 2004).  This study will focus on individual student achievement and attendance data, as did Gottfried (2009; 2010; 2014), but the focus here will be on high school students, while controlling for prior 8$^{th}$ grade achievement.  It will also expand on the work of Balfanz and Byrnes (2013), who also studied individual student attendance but focused on students entering and exciting chronic absenteeism. In addition to studying high school student performance on reading state assessments in relation to achievement, this study will investigate if performance significantly drops after a certain number of days absent, given most schools enforce attendance policies centered on this framework.

**CHAPTER 3**

**Methods**

The purpose of the study was to examine the relationship between absenteeism and Keystone Literature Exam scores, the state mandated assessments for high school students in Pennsylvania. Prior to assessment, each Keystone Exam has a corresponding course. This study examined the relationship between Keystone Literature Exam scores and student class period attendance, both excused and unexcused, during the semester in which students were enrolled in a Keystone Exam-related course (English II) as well as their corresponding Keystone Literature Exam score at the end of said course. The study also examined the relationship between a school district's attendance policy and Keystone Literature Exam scores.

The current study expanded on the works of Balfanz and Byrnes (2013), the Youth Justice Board in New York City (2013), Gottfried (2009; 2010) and NCES (2009b), which called for the need to examine individual student data as pertaining to student absenteeism. To that end, this study focused on individual student achievement and attendance data, in relation with the work of Gottfried. However, this study extended Gottfried's work by sampling high school students and class period attendance. Therefore, the current study investigated both (a) the relationship between Keystone Literature Exam scores and individual English class period absences, and (b) the relationship between an attendance policy and Keystone Literature Exam scores.

**Research Design**

The current study addressed the following research questions and sub-questions:

1) Is there a relationship between the number of semester English class period absences and Keystone Literature Exam scores? The sub-questions were as follows:

   a) Is there a relationship between the total number of excused and unexcused semester English class period absences and Keystone Literature Exam scores?

   b) Is there a relationship between excused semester English class period absences and Keystone Literature Exam scores?

   c) Is there a relationship between unexcused semester English class period absences and Keystone Literature Exam scores?

i) Does that relationship differ for students who attend the STEM building versus the college prep/career and tech prep buildings?

ii) Does that relationship differ for students who are ethnic minorities versus the White students?

iii) Does that relationship differ for students who have an IEP versus those who do not have an IEP?

iv) Does that relationship differ for students who are ELL versus those who are not ELL?

v) Does that relationship differ for students who are ED versus those who are not ED?

vi) Does that relationship differ for students after controlling for prior achievement?

2) Is the relationship between unexcused English class period absences and Keystone

Literature Exam scores different for students who violate the attendance policy (eight or

more unexcused English class period absences per quarter) versus those who do not

violate the attendance policy?

Addressing the various research questions and sub-questions necessitated a multi-

step analysis. Table 2 outlines the purpose, variables associated, and statistical procedures

associated with the various questions (Trochim & Donnelly, 2008; Shaddish, Cook, &

Campbell, 2002). The following sections describe the research setting, attendance

policies, Keystone Exam dependent variable, sample, data collection, and analysis

procedures in greater detail.

Table 2

*Research Design*

| Question | Purpose | Dependent Variable | Independent Variable | Procedure |
|---|---|---|---|---|
| 1a-1c | Identify if a relationship exists between attendance (total number, excused, unexcused) and achievement | Keystone Literature Exam scores | Numbers of class period absences | Linear regression (Ordinary Least Squares (OLS)) |
| 1ci-1cv | Identify if the relationship between attendance (unexcused) and achievement is different at each level of each covariate | Keystone Literature Exam scores | Numbers of unexcused class period absences, buildings, ELL status, IEP status, ED, ethnicity | ANCOVA |
| 1c.vi | Identify the relationship between attendance (unexcused) and achievement after controlling for all covariates | Keystone Literature Exam scores | Numbers of unexcused class period absences, building, ELL status, IEP status, buildings, ED, ethnicity, prior achievement, semester, age at testing, gender, grade | Hierarchical linear regression |
| 2 | Identify if attendance and achievement relationship differs for attendance policy violators versus non-violators | Keystone Literature Exam scores | Numbers of unexcused class period absences | Regression discontinuity |

## Research Setting

The research site utilized for the purposes of this study was a large, public, urban

secondary school in Pennsylvania.  At the time of this study, the school district had an

enrollment of approximately 3,200 to 3,300 students in grades 9 through 12.  The

secondary school, which represented one high school, contained three buildings: a career

and technical preparatory high school, a STEM (science, technology, engineering and

mathematics) high school, and a college preparatory high school building. Figure 1

depicts the organizational structure of the research site. Comprised of student data from

all three buildings, data collection took place from 2013-2015.
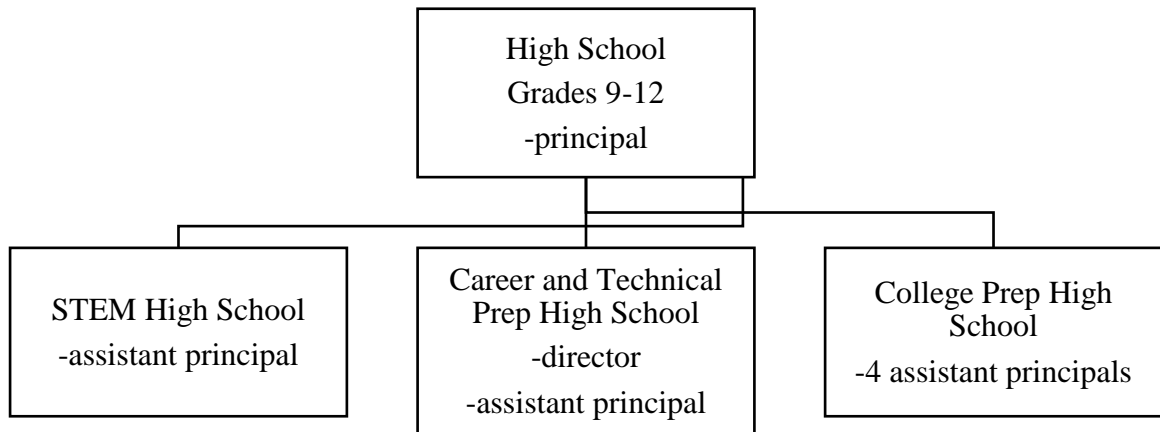


*Figure 1*. The research site contained three high school buildings.

The college preparatory high school and the career and technical preparatory high

school were located across the street from one another.  The STEM high school was

located eight miles away.  One principal was in charge of all high school buildings.  The

college preparatory high school had an assistant principal assigned to each grade,

whereas in the other buildings the assistant principals worked with students in each grade level.  The career and technical preparatory high school had a director who completed administrative tasks specific to career and technical education. In addition, six assistant principals all followed the same rules set forth by the school board and principal, but they varied in their leadership styles.  The three high school buildings shared teachers as needed depending on course scheduling for the current semester.  The three buildings operated on a block scheduling model with two semesters per academic year.

The demographic information for the high school is displayed in Table 3. The state of Pennsylvania considers the three high school buildings involved within the framework of this study as one site/one entity. Therefore, school district administration never tabulated data separately according to individual school building specifics. Most notably, the site had a large economically disadvantaged population, encompassing students predominately of White and Hispanic origin.  The college preparatory high school building housed the majority of the student population.  Students classified as "other" for specific building classification were enrolled in either the alternative learning placement program or segued into outplacement facilities, and were not enrolled in English II during the time of the study. Thus, these students were not included in any further analysis pertaining to this study.  In addition, the average daily attendance stood at approximately 89%, which translated into roughly 358 students being marked absent for any given day.

Table 3

*High School Enrollment and Demographic Information*

|  | 2013-2014 | | 2014-2015 | |
| --- | --- | --- | --- | --- |
| Variable | *%* | *N* | *%* | *N* |
| Total | 100.0 | 3,207 | 100.0 | 3,318 |
| Gender |  |  |  |  |
| Male | 50.9 | 1,631 | 51.4 | 1,704 |
| Female | 49.1 | 1,576 | 48.6 | 1,614 |
| Ethnicity |  |  |  |  |
| White | 54.8 | 1,756 | 52.6 | 1,759 |
| Hispanic | 42.5 | 1,362 | 44.1 | 1,463 |
| Black | 1.8 | 59 | 1.8 | 61 |
| Asian | 0.5 | 17 | 0.6 | 21 |
| Multi-racial | 0.4 | 12 | 0.4 | 13 |
| American Indian | 0.3 | 1 | 0.3 | 1 |
| Student Classification |  |  |  |  |
| ED | 65.5 | 2,101 | 64.0 | 2,125 |
| ELL | 14.6 | 486 | 15.3 | 507 |
| IEP | 10.2 | 327 | 10.4 | 345 |
| Gifted | 3.2 | 104 | 3.2 | 107 |
| Grade |  |  |  |  |
| 9 | 25.4 | 816 | 26.5 | 880 |
| 10 | 26.2 | 840 | 24.8 | 823 |
| 11 | 25.3 | 810 | 25.2 | 834 |
| 12 | 23.1 | 741 | 23.5 | 779 |
| Building |  |  |  |  |
| College Prep | 61.0 | 1,955 | 56.0 | 1,853 |
| Career Prep | 26.5 | 850 | 26.5 | 879 |
| STEM | 10.2 | 328 | 14.2 | 471 |
| Other | 2.3 | 74 | 3.3 | 110 |
| Academic Indicators |  |  |  |  |
| Retention | 3.6 | 111 | 5.2 | 168 |
| Graduation | 80.9 | 599 | 82.8 | 613 |
| Average Yearly Attendance | 88.8 | - | 89.1 | - |
| Academic Score | 56.9 | - | 54.7 | - |

All three high school buildings offered an assortment of general subjects and elective courses, as well as English as second language and special education courses. The college preparatory and STEM high schools offered Advanced Placement and dual enrollment courses, and the career and technical preparatory high school offered specialized courses in the career and technical fields. Admission to the STEM high school was by application only. Students completed an application that consisted of essays, science and mathematical problem analyses, teacher recommendation, transcripts, and PSSA scores.

There was a maximum of 125 STEM students within each grade level. Due to the application process of the STEM high school, students accepted within this respective school tended to be of higher academic caliber than those at the other two buildings. School administration permitted students to transfer between high school buildings at the beginning of each semester.  In this study, students' individual buildings were identified by the building in which they took the Keystone-related course and Exam.

For data collection purposes, students were attributed to the building in which they took the Keystone Literature course, despite the fact that they had the potential to switch buildings throughout their high school career.  The state of Pennsylvania compiled one School Performance Profile (SPP) from a combination of scores from all three high school buildings.  The district chose the high school configuration of the three buildings as one high school unit to maximize both federal and state funding.  The Keystone Literature Exam scores were part of the SPP score.  For school districts in Pennsylvania, the SPP is a state rating system that assigns a percentage score to each school in the state based on a number of relevant academic areas: academic achievement; closing of the

achievement gap for all students and historically underperforming groups; academic

growth based upon the Pennsylvania Value-Added Assessment System (PVAAS); other

academic indicators (attendance rate, graduation rate, promotion rate, advanced

placement credit and PSAT participation); and extra credit for advanced achievement

(PDE, 2016c). As shown in Table 3, the high school utilized for the research study had

SPP scores of 56.9% and 54.7% respectively for the 2013-2014 and the 2014-2015

school years. These scores constituted a below the state average rating for the research

site and was lower than the state's target score of 70%.

The site's organizational structure presented some threats to the external validity

of the study.  Although managed by one principal, it was impossible to be present in three

buildings at one time, thus variations in the fidelity of discipline and teacher evaluation

occurred that would be less common in schools with students housed in one building or

with multiple principals. It was also possible that the unusual structure resulted in

practices varying slightly among buildings in ways that the current study was unequipped

to identify. In addition, it was atypical that the highest achieving students in mathematics

and science attended the STEM building.  For this reason, the current study included a

co-variate analysis to examine differences between the attendance and achievement

relationship of students in the STEM building versus the other two buildings.

### Attendance Policies

In the state of Pennsylvania, many local school boards created policies for their

respective schools in key areas in which the state may not provide specific rules and/or

regulations.  Employees who failed to adhere to district policies risk termination due to

insubordination. The research site enacted a policy which directly addresses specifics of

the attendance issue. It is school district policy #204 - Attendance. The attendance policy stated that any student with eight or more unexcused absences per quarter will receive a failing grade in class participation. Thus, the policy allowed students to miss 28 days of unexcused absences per academic year without penalty. This, in turn, equated to 15.5% of the academic year.  Similarly, students could accumulate any number of excused absences without penalty.

District policy #204 defined an unexcused absence as any absence from school other than a medical or dental appointment, a court hearing, a funeral for a death in the family, a nurse's excuse, or an administrative excuse.  Excused absences, where students provided documentation of a reason outlined by board policy within three days of the return to school, did not count toward the eight-absence penalty. A written note from a parent for reasons other than those listed or lack of documentation constituted an unexcused absence.

Per the attendance policy, class participation constituted 25% of a student's grade each academic quarter.   An academic quarter consisted of 45 schools days, with two quarters per semester and two semesters per academic year.  A failing grade, according to school board policy, was 69% or lower.  Teachers determined students' class participation grades by creating their own respective rubrics, while adhering to the school board's attendance policy.  Each quarter, teachers submitted grades to administration to ensure adherence to the attendance policy was being followed.  For the purposes of this study, I considered students who arrived tardy or left class early, but were present for part of the class, present.  Even though a student was missing some class time, the student was still present for a specific fraction of the material.  Students who amassed more than eight

or more unexcused absences, violating the attendance policy, could still not only take the Keystone Exam at the end of the PVAAS-related course, but could still pass said course as long as the other 75% of their grade was high enough to pass.

School-level policy governed the collection of attendance data. Documenting class period attendance was the responsibility of the teacher, whereas attendance verification was the responsibility of administrative professionals. Teachers took attendance daily at the start of each class period. Administrative professionals checked attendance verification via the school district's online student information management system, *Skyward*. There were seven administrative professionals who dealt with attendance. Five of these administrative professionals were located at the college preparatory high school, as it housed the most students. One administrative professional was housed in the STEM high school, and one administrative professional was housed in the college and technical preparatory high school.

All administrative professionals followed the same protocol, as mandated by the three buildings' one principal. Administrative professionals called the homes of those students listed as absent. Only those parents who neither called the school to report an absence nor sent a written note excusing said absence received a phone call. Administrative professionals reviewed which students were absent from a class and coded the absences as either excused or unexcused as per the receipt of documented proof pertaining to said absence. Unless a student provided the proper documentation, absences were automatically coded as unexcused and changed only if necessary. Teachers were never permitted to code absences. Teachers reviewed student absences in *Skyward* in order to determine if the number of unexcused absences per quarter warranted

a student's failing grade for class participation.  If an attendance error was made, parents, students and/or teachers could discuss the error and correct it if deemed necessary. Truancy officers visited the homes of students who were frequently absent, and parents and students risked possible court hearings and fines.

**Keystone Exams**

The analyses answered the research questions by gathering Keystone Literature Exam scores from first time test takers between the time periods of the 2013-2014 and the 2014-2015 school years.  The high school operated on a block-scheduling model with four 90-minute classes per day.  Each high school building offered English II during each semester of the academic year.  The high school administered winter Keystone Exams at the end of the first semester, as well as offered the spring Keystone Exams two weeks before the end of the second semester.

Students in all three high school buildings were enrolled in English I in 9th grade and enrolled in English II for their sophomore year.  Special education students took courses with the help and support of special education teachers. English Language Learners (ELL) were enrolled in ESL I, II, III or IV depending on their level of English proficiency.  After a student exited the English as a second language (ESL) program, he or she took the grade level appropriate English course; English I in 9th grade, English II in 10th grade, English III in 11th grade, and English IV in 12th grade. However, if students transferred to any of the high school buildings from an outside high school with a different course sequence, it was possible that said students may have been enrolled in a Keystone related course in a grade level different from that of the research site. To determine whether the amount of support offered to both ELL and special education

students resulted in differences in the effects of unexcused absences, the research design included co-variate analyses to analyze the attendance and achievement relationship of IEP and ELL students separately.

High school teachers gave Keystone Literature Exams in a strict testing environment, with all testing classrooms contained in one area.  Any ESL and special education students requiring accommodations were tested in separate testing rooms with support teachers.  Each Keystone Literature Exam contained two modules.  Teachers administered each module on consecutive days.  Any student was able to request extended time, but the module had to be completed in one school day.  If a student missed an exam, guidance counselors conducted make-up exams during the state designated period.  A school assessment coordinator stored Keystone Exams in a locked room during the testing period (PDE, 2016a).  Students were administered the Keystone Exams at the end of their Keystone-related English II course in January and May of each year during state-mandated, test designated days.  Those Students enrolled in a Keystone course in the first semester of the academic year were administered the corresponding Keystone Exam in January.  Those Students enrolled in a Keystone course in the second semester of the academic year were administered the corresponding Keystone Exam in May (PDE, 2016a).  All students must have the opportunity to take the exam at least one time in their high school career.  A score of 1,500 was the minimum score for proficiency (passing) for the Literature Keystone Exam.

<div align="center">**Sample**</div>

Data collection took place during the following testing periods: Winter 2013-2014, Spring 2014, Winter 2014-2015 and Spring 2015.  The sample included 1,551

students enrolled in English II, who were first time Keystone Literature Exam test takers. To eliminate testing familiarity, I only considered first-time test takers' scores for analysis because students could retake the test multiple times until successfully passing the exams.

I gathered student demographic data and numbers of classes absent for English II in the semesters and quarters prior to the Keystone Exams.  Student demographic data consisted of gender, grade level, testing semester, age at testing, ESL status, IEP status, ED status, building, Keystone Literature Exam scores, and 8th grade PSSA Reading and Writing Exam scores (Allensworth, Gwynne, Moore & De la Torre, 2014; Youth Justice Board, 2013; NCES, 2009b, Spencer, 2009).   To answer the first research question, I collected the total numbers of classes absent, excused, unexcused, and a combined total number of classes absent, from the first day of the semester until the Keystone Literature Exam.  To answer the second research question, data included the total number of unexcused class absences from the first day of the quarter prior to the Keystone Literature Exam until the testing date of the Keystone Literature Exam.  Since all students miss school when there is an inclement weather day, the research did not account for this in the statistical analysis.  This approach was justified by Goodman's (2014) finding that teachers work to make up the material missed during an inclement weather day, and that an absence from an inclement weather day is not as detrimental to the educational process as a regular absence when the rest of the school is in session.

## Data Collection Procedures

I downloaded student demographic data, scaled Keystone Literature Exam scores, and scaled eighth-grade PSSA Reading and Writing Exam scores from the eMetric data

base.  The eMetric system is a data base from PDE that houses students' demographic information and test scores for each individual school and school district in the state of Pennsylvania.  Analyses used scaled scores for data analysis to allow for the accurate comparison of scores across academic years.

To ensure that there was no multi-collinearity between variables, I analyzed the correlation between variables as seen in Table 4. To maintain statistical power, the analysis was narrowed to show only those variables with the strongest theorized relationships with the outcomes of interest.  Therefore, the analyzed variables in sub-questions 1c.i-1c.vi included the following: building, ethnicity, IEP, ELL and ED status and prior achievement. The building variable was dummy coded as a dichotomous variable, 0 = non-STEM, 1 = STEM. Ethnicity was coded as a dichotomous variable, 0 = non-White, 1 = White.  Zero represented the Hispanic, Black, Multi-racial and Asian students.  Multi-racial students self-identified as more than one ethnicity group.

Table 4

*Correlation Table of Variables*

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Grade |  |  |  |  |  |  |  |  |  |
| 2. Build. | -0.24*** |  |  |  |  |  |  |  |  |
| 3. Gender | -0.03 | 0.04 |  |  |  |  |  |  |  |
| 4. Age | 0.39*** | -0.15*** | 0.09*** |  |  |  |  |  |  |
| 5. Ethni. | -0.27*** | 0.22*** | 0.03 | -0.14*** |  |  |  |  |  |
| 6. IEP | -0.02 | 0.04 | -0.09*** | -0.13*** | 0.02 |  |  |  |  |
| 7. ELL | -0.55*** | 0.27*** | 0.02 | -0.30*** | 0.46*** | -0.01 |  |  |  |
| 8. Sem. | -0.03 | 0.07** | 0.04 | 0.18*** | -0.19*** | -0.03 | -0.08** |  |  |
| 9. ED | -0.10*** | 0.16*** | 0.04 | -0.10*** | 0.45*** | 0.07** | 0.28*** | -0.10*** |  |
| 10. Un. Ab. | 0.01 | -0.15*** | 0.02 | 0.18*** | -0.11*** | -0.08** | -0.10*** | 0.11*** | -0.20*** |

*Note:* Build. = Building; Ethni.= Ethnicity; IEP= Students with an individual education plan; ELL= English Language Learner; Sem.= Semester; ED= Economically Disadvantaged, Un. Ab. = Unexcused Absences

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$

After merging attendance data with the spreadsheets created from the eMetric database, all data sets were immediately de-identified. Data was sorted in numerical order by the Pennsylvania Secure Identification Number, an arbitrary number assigned by the state. The numerical order had no identifying characteristics related to the student data. All data was stored on a password protected computer to maintain data security of student information, with the researcher being the only person with access to the data. Data collection took approximately six weeks.

### Data Analysis

Before the analyses of research questions one and two, an analysis was conducted for the means, standard deviations (*SD*), minimum scores, and maximum scores of all continuous variables, including age, Keystone Literature Exams scores, 8th PSSA Reading and Writing Exam scores, and number of English class period absences (excused

and unexcused).  Also tested were the requisite assumptions required for the statistical analyses described in the following sections.

**Research Question 1**

To identify the relationship between the numbers of student absences registered for Keystone-related English II class periods and students' related Keystone Literature Exam scores, research question one, along with its sub-questions, relied on linear regression (OLS), ANCOVA and hierarchical linear regression analyses. Three linear regressions (OLS) examined the relationships between Keystone Literature Exam scores and total absences, excused absences, and unexcused absences (Trochim & Donnelly, 2008; Shaddish, Cook and & Campbell, 2002).  Student attendance and achievement data was not separated by testing year and semester, due to the fact that each semester included different students, all first time testers, taking the Keystone Literature Exam. The linear regression (OLS) models determined if total number of English class period absences, excused English class period absences, and unexcused English class period absences were significant predictors of Keystone Literature Exam scores.

Sub-questions pertaining to Question 1 required additional analyses of demographic data in order to identify whether relationships between attendance and achievement data differed on the bases of the following demographic variables: students attending the STEM building versus the other two high school buildings (college and career and technical preparatory), White versus non-White, IEP versus non-IEP, ELL versus non-ELL and ED versus non-ED.  Therefore, Questions 1c.i-1c.v relied on an ANCOVA to test whether the link between unexcused English class period absences and achievement differed for the subgroups in Questions 1c.i-1c.v.  Subsequent to the

ANCOVAs, additional linear regression (OLS) analyses were computed to quantify the differences between groups of students defined by the covariate variables, utilizing the same formula as Question 1a with the outcome variable Keystone Literature Exam scores and the predictor variable unexcused English class period absences. Question 1c.vi relied on a hierarchical linear regression to test whether the relationship between unexcused absences and Keystone Literature Exam scores differed after controlling for the demographic variables found in Sub-questions 1c.i-1c.v with the addition of gender, age at testing, semester, grade and PSSA Reading and Writing Exam scores, which constituted prior achievement (Trochim & Donnelly, 2008; Shaddish, Cook and & Campbell, 2002).

**Research Question 2**

The analyses for Question 2 examined the relationship between unexcused English class period absences and Keystone Literature Exam scores for students who violated the attendance policy with eight or more unexcused English class period absences per quarter versus those who did not violate the attendance policy. Question 2 relied on a regression discontinuity (RD) analysis to determine if the achievement/absenteeism link differed for students who violated the attendance policy versus those who did not violate the attendance policy. According to Smolkowski, Chaparro, Smith, and Fien (2015), "RD design and analysis use a single score on a continuous assignment variable to determine the dichotomous treatment indicator" (p.228). The number of unexcused English class period absences served as the assignment and predictor variable. The "assignment variable may be any variable measured before treatment" (Shaddish, Cook, & Campbell, 2002, p.209). The treatment

indicator was the violation of the attendance policy, where eight unexcused English class period absences was the inflection point of the discontinuity portion of the regression, which per policy requires students to receive a failing grade for class participation. The outcome variable was Keystone Literature Exam scores.

Similar to the Question 1 analysis, Question 2 relied on individual student data from Keystone Literature Exam scores, corresponding attendance data, and combined individual student attendance data and Keystone Literature Exam scores from the 2013-2015 school years. The initial RD analysis used a scatter plot to diagram Keystone Literature Exam scores on the Y axis and number of unexcused English class period absences, for the quarter prior to the Keystone Literature Exam, on the X axis. These charts differed from the Linear regression (OLS) utilized in Question 1 by including a cutoff line to represent the violation of the attendance policy and regression lines for students who violated the attendance policy and those who did not. Because students with seven or fewer unexcused English class period absences did not violate the attendance policy, the RD analysis focused on the cutoff point of seven (and lower) versus eight (and higher) unexcused English class period absences (Baker, Smolkowski, Chaparro, Smith, & Fien, 2015; Smolkowski, Strycker, & Seely, 2013; Trochim & Donnelly, 2008; Shaddish, Cook, and & Campbell, 2002). Further RD analyses examined whether the slope of the regression was significantly different for students who had less than eight unexcused English class period absences versus those who had eight or more unexcused English class period absences, thus violating the attendance policy.

**Summary**

Based on the need for further research in the area of individual student attendance data, specifically by class period, and achievement data, this study sought to provide further analysis for the body of educational literature. By examining Keystone Exam scores and the number of individual class period absences before the exam, analyses demonstrated if excused, unexcused, and total number of English class period absences were significant predictors of Keystone Literature Exam scores for both the entire sample and for the subgroups within the school population. The research design's combination of linear regression (OLS), ANCOVA and hierarchical linear regression analyses with RD sought to determine if there was a link between attendance policy and achievement. A significant difference between the two groups indicated that the attendance policy is a significant predictor of Keystone Literature Exam scores.

# CHAPTER 4

## Results

This study sought to investigate the relationship between attendance and achievement in an urban high school setting, specifically examining differences between excused and unexcused class period absences in a course prior to state assessment. The study examined differences between the attendance and the achievement relationship of students in three independent high school buildings, comprised as one large, urban high school. Also addressed were pertinent issues pertaining to the following: ethnic minorities, special education students, English Language Learners, economically disadvantaged students and prior achievement. In addition, the current study examined the relationship between achievement and the school district's attendance policy.

This chapter is organized into three sections. The first section discusses the descriptive data that provides background on the study participants. The second and third sections are dedicated to research questions one and two respectively. Following the report of results from the statistical analyses, sections two and three conclude with brief summaries of the findings.

## Descriptive Data

The sample included 1,551 students from a single urban high school in Pennsylvania comprised of three separate buildings. Table 5 displays descriptive data for the sample as organized, first, by the combination of all three high school buildings and then, second, as individual buildings. All students, who were first time Keystone Literature Exam test takers during the 2013-2014 and 2014-2015 school years, were enrolled in either an English II course or in a special education/ESL equivalent of said

course.  Table 5 presents all participant data. The data is neither divided by testing year

nor semester, as all students were first time test takers enrolled in an English II, or

equivalent course, which was prior to the Keystone Literature Exam.  The sample was

evenly split between genders and White and Hispanic ethnicities, with slightly more

White students.  Overall, 9.2% of the sample group received some type of special

education services. However, this did not include students labeled as gifted learners. In

addition, 19% of the students within the sample group were labeled as ELLs, along with

64.9% being labeled as ED.  The percentage of study participants in each level of the

district's ESL program was in reference to the 295 ELLs in the sample.

Differences existed in the comparison among the three high school buildings.

The college preparatory high school housed the most students compared with the other

two buildings.  The college preparatory and career and technical preparatory high school

buildings were characterized by similar demographics.  The STEM high school had the

smallest number of ethnically diverse, ELL, IEP and ED students.  The STEM high

school not only possessed the highest state assessment scores among the three buildings,

as anticipated by the fact that the school is comprised of academic high achieving

students, but it was also the building with the least number of student absences.  School

policy mandated that testing must occur at the completion of English II, which was a 10th

grade course.  Students not testing in their 10th grade year resulted from either a grade

level failure or a transfer in from another state or country.

Of the total number of students in the sample, approximately 9% violated the

attendance policy, amassing eight or more unexcused class periods within a specific

course during the school year. The STEM high school had the smallest number of

students violate the policy, with only one student in violation, as compared to 9% at the college preparatory high school and 12% at the career and technical preparatory high school.  It was possible for a student to miss more than eight days and violate the policy in one quarter of the semester and not violate the policy in the next quarter within the same semester.  Policy violation elicited a negative consequence mandated by the research site's school board.  The school board required that teachers give those students violating the attendance policy a failing score in class participation, constituting 25% of their overall grade.  As students either came to school late or left early, teachers gave class participation grades based on attendance within their respective courses.  The attendance policy violations relevant to the current study were those that would most likely affect performance on the Keystone Literature Exam. Therefore, all attendance data was specific to students' English course prior to the Keystone Literature Exam.

Table 5

*Frequencies and Percentages of Students in Each Demographic Category*

| Variable | % | High School | % | College Prep | % | Career Prep | % | STEM |
|---|---|---|---|---|---|---|---|---|
| Total | 100.0 | 1,551 | 46.8 | 726 | 36.8 | 570 | 16.4 | 255 |
| Gender | | | | | | | | |
| Female | 50.2 | 779 | 52.8 | 383 | 47.4 | 270 | 49.0 | 125 |
| Male | 49.8 | 722 | 47.2 | 343 | 52.6 | 300 | 51.0 | 130 |
| Ethnicity | | | | | | | | |
| White | 51.0 | 791 | 43.5 | 316 | 46.1 | 263 | 83.1 | 212 |
| Hispanic | 46.8 | 726 | 54.3 | 394 | 52.0 | 296 | 14.1 | 36 |
| Black | 1.4 | 21 | 1.7 | 12 | 1.2 | 7 | 0.8 | 2 |
| Multi-racial | 0.5 | 8 | 0.4 | 3 | 0.7 | 4 | 0.4 | 1 |
| Asian | 0.3 | 5 | 0.1 | 1 | 0.0 | 0 | 1.6 | 4 |
| IEP | | | | | | | | |
| Not IEP | 90.8 | 1,409 | 92.0 | 668 | 85.6 | 488 | 99.2 | 253 |
| IEP | 9.2 | 142 | 8.0 | 58 | 14.4 | 82 | 0.8 | 2 |
| ELL | | | | | | | | |
| Not ELL | 81.0 | 1,256 | 70.5 | 512 | 86.3 | 492 | 98.8 | 252 |
| ELL | 19.0 | 295 | 29.5 | 214 | 13.7 | 78 | 1.2 | 3 |
| ED | | | | | | | | |
| Not ED | 35.1 | 545 | 33.7 | 245 | 24.2 | 138 | 63.9 | 163 |
| ED | 64.9 | 1,006 | 66.3 | 481 | 75.8 | 432 | 36.1 | 92 |
| Grade | | | | | | | | |
| 9 | 1.2 | 19 | 1.2 | 9 | 1.8 | 10 | 0.0 | 0 |
| 10 | 89.0 | 1,360 | 79.6 | 578 | 96.1 | 548 | 99.6 | 254 |
| 11 | 9.8 | 152 | 19.2 | 139 | 2.1 | 12 | 0.5 | 1 |
| Testing Semester | | | | | | | | |
| 1 | 42.2 | 655 | 47.2 | 343 | 37.0 | 211 | 40.4 | 103 |
| 2 | 57.8 | 896 | 52.8 | 383 | 63.0 | 359 | 59.6 | 152 |
| Policy Violation | | | | | | | | |
| No | 91.2 | 1,414 | 90.8 | 659 | 87.9 | 501 | 99.6 | 254 |
| Yes | 8.8 | 137 | 9.2 | 67 | 12.1 | 69 | 0.4 | 1 |
| Days Absent | | | | | | | | |
| Total | - | 7 | - | 7 | - | 8 | - | 4 |
| Unexcused | - | 5 | - | 5 | - | 6 | - | 2 |
| Excused | - | 1 | - | 1 | - | 1 | - | 1 |
| Average Keystone Literature Exam Score | - | 1,491 | - | 1,484 | - | 1,474 | - | 1,546 |
| Average PSSA Writing Score | - | 1,320 | - | 1,327 | - | 1,217 | - | 1,512 |
| Average PSSA Reading Score | - | 1,447 | - | 1,434 | - | 1,339 | - | 1,700 |

The means, standard deviations (*SD*), minimum scores, and maximum scores of all continuous variables are present in Table 6. As shown in the table, the typical student was about 16 years old at the time of testing; the mean score for the Keystone Literature Exam was 1,490.48 (*SD* = 57.67), and 1,500 was the minimum passing score. Thus, the typical student scored just below passing on the Keystone Literature Exam. The PSSA Reading and Writing Exam scores provide a record of prior achievement. The mean score for the PSSA Writing Exam was 1,320.48 (*SD* = 273.13), and the mean score for the PSSA Reading Exam was 1,447.08 (*SD* = 284.84) with both averages falling below the state averages of 1,325 and 1,465, respectively. These averages fluctuate year to year based on the raw score. There were no out-of-range values.

Table 6

*Descriptive Statistics for All Continuous Variables*

|  | *N* | | Mean | *SD* | Minimum | Maximum |
|---|---|---|---|---|---|---|
|  | Valid | Missing |  |  |  |  |
| Age at testing date | 1,551 | 0 | 15.74 | 0.72 | 14 | 19 |
| Literature Keystone | 1,521 | 30 | 1490.48 | 57.67 | 1,298 | 1,707 |
| PSSA Writing | 1,213 | 338 | 1320.48 | 273.13 | 700 | 2,341 |
| PSSA Reading | 1,245 | 306 | 1447.08 | 284.84 | 744 | 2,626 |
| Total days absent | 1,551 | 0 | 7.03 | 6.31 | 0 | 54 |
| Total unexcused absences | 1,551 | 0 | 5.40 | 5.29 | 0 | 54 |
| Total excused absences | 1,551 | 0 | 1.63 | 2.63 | 0 | 23 |

Some students in the sample had missing data on one or more of the following: Keystone Literature Exams, PSSA Reading Exams, or PSSA Writing Exams. Some reasons for the missing data include: 30 students took English II, but were absent and did not take the Keystone Literature Exam; 338 did not take the PSSA Writing Exam, and 306 students did not take the PSSA Reading Exam either because they were absent and

did not make-up the exam, or because they were not enrolled in the school district when the exam was given. The research site houses a highly transient population, as displayed by the large number of students who did not take the PSSA Reading and Writing Exam.

The mean for total English class period absences was about seven class periods. The mean for unexcused English class period absences was between five and six class periods, and the mean for excused English class period absences was between one and two class periods. However, the English class period absences were as high as 54 class periods during the testing semester

The histograms in Figures 2 through 4, indicate the data for total number of English class period absences, number of unexcused English class period absences, and number of excused English class period absences were all positively skewed for the semester prior to the Keystone Literature Exam for students who were enrolled in English II or an equivalent course. Students had a higher number of unexcused than excused English class period absences.
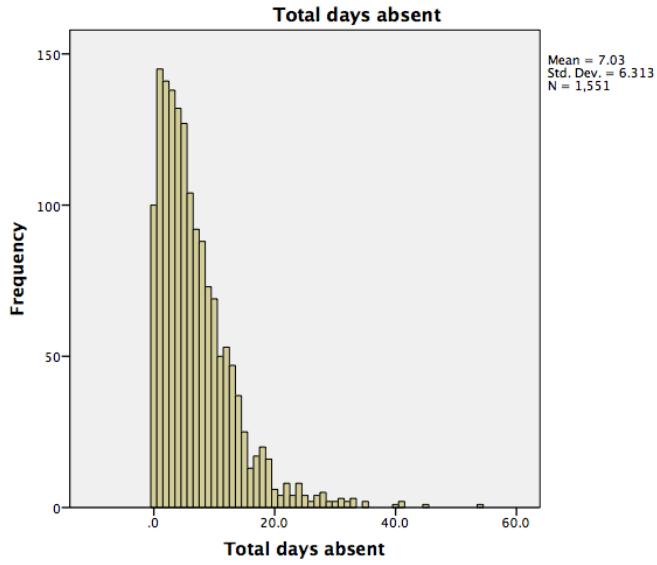
*Figure 2*. These data represent a histogram of the total number of English class period absences.
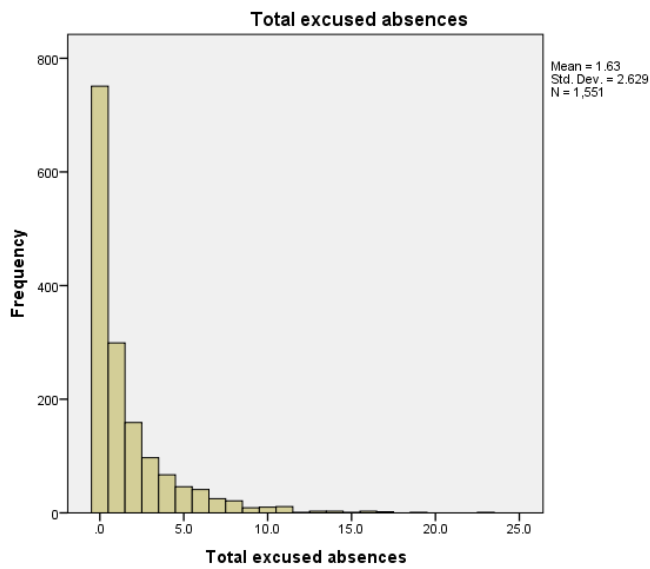


*Figure 3*. These data represent a histogram of the total number of excused English class period absences.
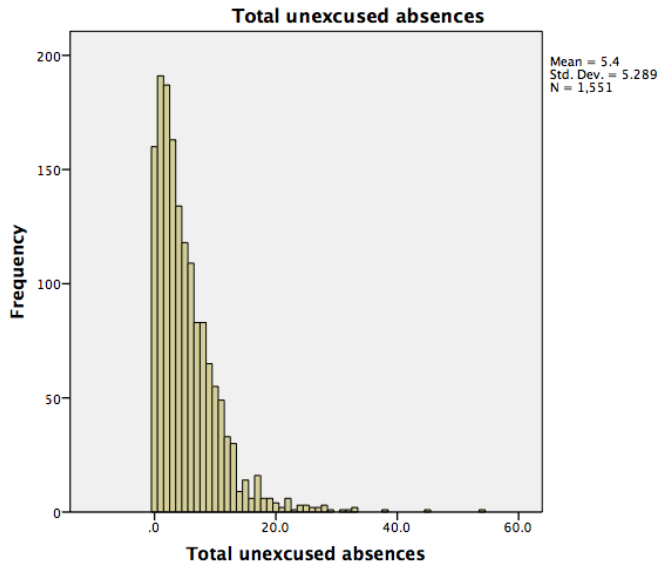
*Figure 4.* These data represent a histogram of the total number of unexcused English class period absences.

## Question 1

*Is there a relationship between the number of semester English class period absences and Keystone Literature Exam scores?* The sub-questions were as follows:

*a)  Is there a relationship between the total number of excused and unexcused semester English class period absences and Keystone Literature Exam scores?*

*b) Is there a relationship between excused semester English class period absences and Keystone Literature Exam scores?*

*c) Is there a relationship between unexcused semester English class period absences and Keystone Literature Exam scores?*

I answered Question 1 by applying a linear regression (OLS) to model the relationships between the number of semester English class periods absent−total, excused, and unexcused−and Keystone Literature Exam scores (Trochim & Donnelly, 2008; Shaddish, Cook and & Campbell, 2002).  I completed three analyses for research Question 1 using three different linear regression (OLS) models.  The three analyses used

75

the individual student data from Keystone Literature Exam scores and the corresponding

student attendance data.  I combined all semesters of individual student attendance and

achievement data from the 2013-2015 school years because each semester included

different students who were all first-time Keystone Literature Exam test takers.

The following equations correspond with the three separate linear regressions

(OLS) investigating Sub-questions 1a-1c:

a)    $Y = a^a + b^a X^a$

b)    $Y = a^b + b^b X^b$

c)    $Y = a^c + b^c X^c$

$X^a$ represented the number of total English class period absences.  $X^b$ represented the

number of excused English class period absences, and $X^c$ represented the number of

unexcused English class period absences. Y represented the Keystone Literature Exam

score.  The symbol $a^a$ represented the intercept for equation, $a^b$ represented the intercept

for equation b, $a^c$ represented the intercept for equation c. The symbol $b^a$ represented the

slope for equation a, $b^b$ represented the slope for equation b, and $b^c$ represented the slope

for equation c.

Table 7 presents the results of the linear regression (OLS) analysis for total

English class period absences, excused English class period absences, and unexcused

English class period absences derived from the 1,551 first time Keystone Literature Exam

test takers, which comprised the sample.  The $R^2$ for the predictor Total Absences

(excused and unexcused) was .038, indicating 3.8% of the variance in Keystone

Literature Exam scores could be explained by the number of total English class period

absences. This was a significant inverse effect with a standardized Beta of -0.195 ($p <$

.001, α = .05). The Beta coefficient showed that with a one standard deviation increase in the number of total English class period absences, there was a corresponding 0.195 standard deviation decrease in the Keystone Literature Exam scores. For example, a one standard deviation increase in the total number of English class periods absent was equivalent to six class periods.  Students absent six class periods would experience a corresponding Keystone Literature Exam score decrease of approximately 11.25 points [.195(57.67) = 11.25].

Table 7

*Results of Regression of Keystone Literature Exam Scores on English Class Period Absences*

| Predictor | $R^2$ | Standardized Beta | $P$ |
|---|---|---|---|
| Number of total absences | 0.038 | -0.195 | <.001 |
| Number of excused absences | 0.001 | -0.020 | .237 |
| Number of unexcused absences | 0.051 | -0.230 | <.001 |

Turning to Sub-question b, the $R^2$ for the predictor Excused Absences was 0.001, as displayed in Table 7.  A standardized Beta of -0.020 with the *p*-value equal to 0.237 indicated no discernable relationship. Therefore, a change in excused English class period absences was not significantly linked to Keystone Literature Exam scores.

The results from the analysis of Sub-question c are also shown in Table 7. The $R^2$ for the predictor Unexcused Absences was 0.051, meaning 5.1% of the variance in Keystone Literature Exam scores could be explained by the number of unexcused English class period absences. This was a significant inverse effect with a standardized Beta of -0.230 ($p < .001$, α = .05). The Beta coefficient showed that with a one standard deviation increase in the number of unexcused English class period absences, there was a

corresponding 0.23 standard deviation decrease in the Keystone Literature Exam scores.

For example, a one standard deviation increase in the number of unexcused English class

periods absent was equivalent to five class periods absent.  These results implied that five

student English class period absences corresponded with a Keystone Literature Exam

score decrease of 13.24 points [.23(57.67) = 13.24].

These results indicated that both unexcused English class absences and total

absences were significant predictors of Keystone Literature Exam scores, while excused

absences on their own were not. However, because both excused and unexcused absences

formed the significant predictor Total Absences and students may have had both types of

absences, the results fail to support claims that excused absences had no effect on test

scores at all.

**Covariate Variable Analysis: Sub-questions 1c.i-1c.vi**

The questions were as follows:

1. *Is there a relationship between unexcused semester absences and Keystone*

   *Literature Exam scores?*

   *1c.i) Does that relationship differ for students who attend the STEM building versus*

   *the college prep/career and tech prep buildings?*

   *1c.ii) Does that relationship differ for students who are ethnic minorities versus the*

   *White students?*

   *1c.iii) Does that relationship differ for students who have an IEP versus those who do*

   *not have an IEP?*

*1c.iv) Does that relationship differ for students who are ELL versus those who are not*

   *ELL?*

*1c.v) Does that relationship differ for students who are ED versus those who are not*

   *ED?*

*1c.vi) Does that relationship differ for students after controlling for prior*

   *achievement?*

For Sub-questions 1c.i-1c.v, I computed ANCOVAs to examine any differences between groups of students defined by the covariate variables utilizing a similar formula as Sub-question 1c. By conducting additional analyses of demographic data, I sought to identify relationships, not only between attendance and achievement data in an urban high school setting, but to also identify if students differed on the bases of the following demographic variables: students attending the STEM building versus the other two high school buildings (college and career and technical preparatory), White versus non-White, IEP versus non-IEP, ELL versus non-ELL, and ED versus non-ED.  The dependent variable in Sub-questions 1c.i-1c.vi was Keystone Literature Exam scores.

Sub-question 1c.vi, adding the additional covariate of prior achievement represented by PSSA Reading and Writing Exam scores, as well as gender, demographic variables, age at testing, testing semester and grade. Question 1c.vi relied on a hierarchical linear regression to identify if the relationship between unexcused English class period absences and achievement differed after controlling for all covariates including prior achievement. The hierarchical linear regression used the following formulas:

Model 1: $Y = b_0 + b_1 PSSA + \varepsilon$

Model 2: $Y = b_0 + b_1 PSSA + b_2 BUILDING + b_3 ETHNICITY + b_4 GENDER +$
$b_5 IEP + b_6 ELL + b_7 ED + b_8 AGE + b_9 SEMESTER + b_{10} GRADE + \varepsilon$

Model 3: $Y = b_0 + b_1 PSSA + b_2 BUILDING + b_3 ETHNICITY + b_4 GENDER +$
$b_5 IEP + b_6 ELL + b_7 ED + b_8 AGE + b_9 SEMESTER + b_{10} GRADE +$
$b_{11} UNEXCUSED + \varepsilon$

**Building.** For the analysis for Sub-question 1c.i, the unexcused English class period Unexcused Absences variable and Building were entered as independent variables. Building was configured as a dichotomous variable, $0 =$ non-STEM ($n = 1,296$), $1 =$ STEM ($n = 255$). The ANCOVA tested whether the relationship between Unexcused Absences and Keystone Literature exam scores was different for students in the STEM building versus the students in the non-STEM buildings (college and career and technical preparatory). To test for interactions, I entered a joint effect for unexcused absences and STEM building versus the students in the non-STEM buildings. The results pictured in Table 8, indicated the joint effect of unexcused absences and STEM building versus the students in the non-STEM buildings was not significant ($F[1] = .171$, $p = .679$). Thus, the relationship between unexcused English class period absences and Keystone Literature Exam scores appeared to be consistent across buildings.

Table 8

*ANCOVA Results of Building Type Differences Between Unexcused English Class Period Absences and Keystone Literature Exam Scores*

| Source | *Df* | Mean Square | *F* | *p* |
|---|---|---|---|---|
| Model | 3 | 340,835.16 | 128.22 | <.001 |
| Absences | 1 | 21,663.08 | 8.15 | .004 |
| Building | 1 | 387,966.77 | 145.95 | <.001 |
| Absences * Building | 1 | 454.78 | 0.17 | .679 |
| Error | 1,517 | 2,658.16 | | |

*Note.* a. $R^2 = .202$ (Adjusted $R^2 = .201$)

**Ethnicity.** Using the same procedure for the analysis of Sub-question 1c.ii, I conducted an ANCOVA to test whether the relationships between unexcused English class period absences and Keystone Literature Exam scores differed for White students (ethnicity code = 1, $n = 791$) versus non-White students (ethnicity code = 0, $n = 760$). As shown on Table 9, the relationship between unexcused absences and Keystone Literature Exam scores differed for White students versus non-White students as demonstrated by the significance of the joint effects term (absences* ethnicity; $F [1] = 5.735$, $p = .020$). Thus, the next step was to analyze the relationship between unexcused English class period absences and Keystone Literature Exam scores, separately for White students versus non-White students to obtain a clear understanding of how the associations differed for the two groups.

Table 9

*ANCOVA Results for Ethnic Group Differences Between Unexcused English Class Period Absences and Keystone Literature Exam Scores*

| Source | Df | Mean Square | F | p |
|--------|----|-----|----|----|
| Model | 3 | 378,691.76 | 146.59 | <.001 |
| Absences | 1 | 137,433.18 | 53.21 | <.001 |
| Ethnicity | 1 | 520,222.18 | 201.38 | <.001 |
| Absences * Ethnicity | 1 | 14,816.00 | 5.74 | .020 |
| Error | 1,517 | 2,583.30 | | |

*Note.* a. $R^2$ = .225 (Adjusted $R^2$ = .223)

As shown on Table 10, the relationship between unexcused English class period absences and Keystone Literature Exam scores was significant and negative for non-White students ($p < .001$). The unstandardized regression coefficient was -1.400. Therefore, for every period increase in unexcused English class period absences, there was a 1.4 point decrease on Keystone Literature Exam scores. For example, when comparing two students, one with zero unexcused English class period absences and one with ten unexcused English class period absences, the corresponding Keystone Literature Exam score was 14 points lower for the student who had ten unexcused English class period absences.

Table 10

*Linear Regression Results of Unexcused English Class Period Absences and Keystone Literature Exam Scores by Ethnicity*

| | β | SE | t | P |
|--------|-----|-----|----|----|
| Non-White | -1.400 | .346 | -4.04 | <.001 |
| White | -2.769 | .445 | -6.22 | <.001 |

By contrast, the relationship between unexcused absences and Keystone Literature Exam scores was also significant and negative for White students ($p < .001$).

However, the size of the negative relationship was even larger (more negative) for White students than for non-White students. The unstandardized regression coefficient for White students was -2.769. Thus, for every additional period of unexcused English class period absences for White students, there was a decrease of 2.8 points on the Keystone Literature Exam scores.

As shown on Figure 5 below, the regression line for the relationship between unexcused English class period absences and Keystone Literature Exam scores was slightly (and significantly) steeper for White students (green regression line) than for non-White students (blue regression line). The regression line for White students began above the minimum proficiency level of 1,500, whereas the regression line for non-White students began below the proficiency level. Although the White student group lost more points per day, this group was still outperforming the non-White student group until approximately 40 un-excused English class period absences.
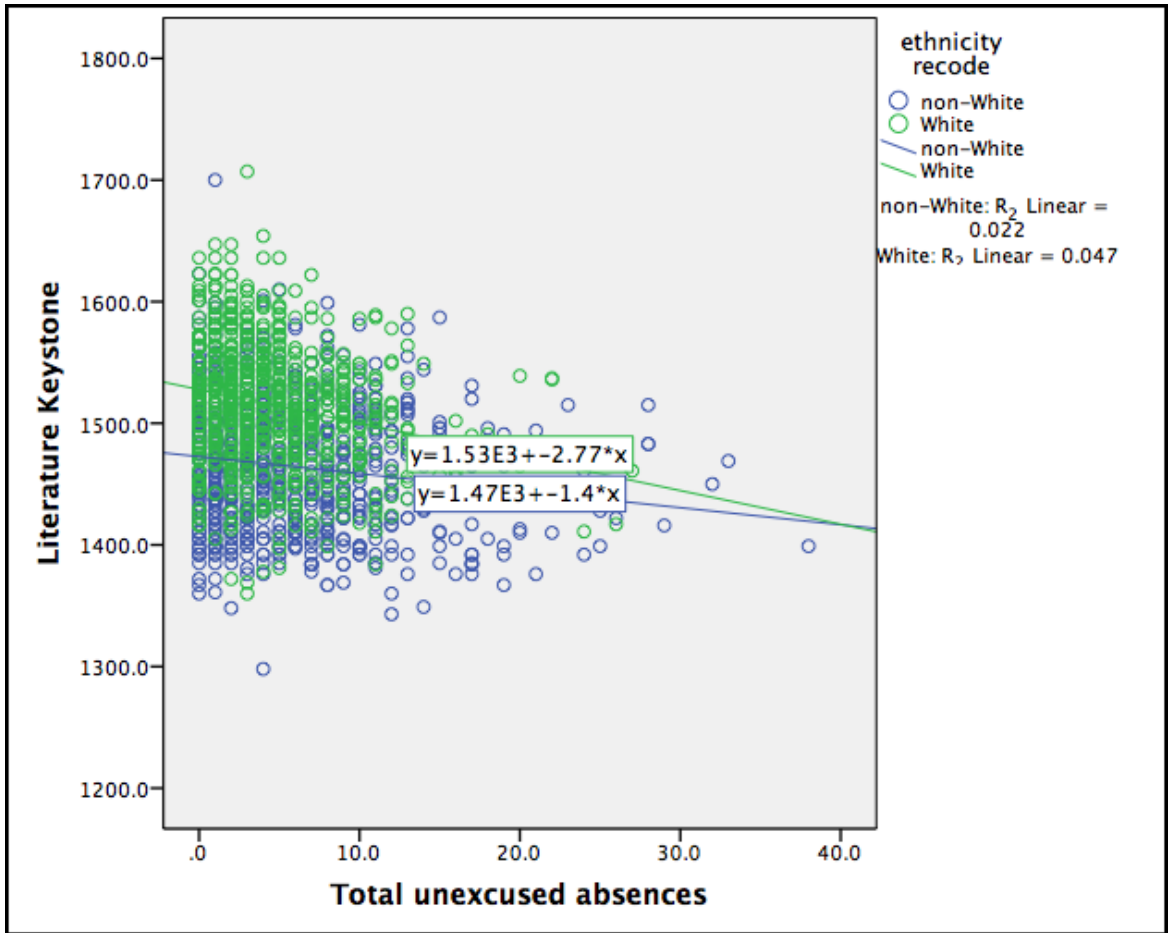
*Figure 5.* The figure shows the regression lines between unexcused English class period absences and Keystone Literature Exam Scores for White (green data points and green regression line) and non-White students (blue data points and blue regression line).

**IEP.** Using the same procedure for the analysis of Sub-question 1c.iii, I conducted an ANCOVA to test whether the relationship between unexcused English class period absences and Keystone Literature Exam scores differed for students with an IEP (IEP code = 1, *n* = 142) versus those without an IEP (non-IEP code = 0, *n* = 1,256), excluding gifted learners. As show in Table 11, the relationship between unexcused absences and Keystone Literature Exam scores differed for IEP versus non-IEP students. This effect was revealed by the significant joint effects term (absences*IEP; *F* [1] = 6.504, *p* = .011). Thus, the next step was to re-compute the relationship between

unexcused English class period absences and Keystone Literature Exam scores,

separately for IEP students versus non-IEP students in  to get a clear understanding of

how the relationships differed for the two groups.

Table 11

*ANCOVA Results for the Test of IEP Group Differences Between Unexcused English Class Period Absences and Keystone Literature Exam Scores*

| Source | *Df* | Mean Square | *F* | *p* |
|---|---|---|---|---|
| Model | 3 | 192,000.37 | 65.03 | <.001 |
| Absences | 1 | 47,108.09 | 15.96 | <.001 |
| IEP | 1 | 225,103.29 | 76.24 | <.001 |
| Absences * IEP | 1 | 19,204.15 | 6.51 | .011 |
| Error | 1,517 | 2,952.50 | | |

*Note. a. $R^2$ = .114 (Adjusted $R^2$ = .112)*

Table 12 shows the relationship between unexcused absences and Keystone

Literature Exam scores was not significant for students in the IEP group ($\beta$ = -0.603, $t$ = -1.06, $p$ = .293). Thus, the findings indicate no significant relationship between unexcused

English class period absences and Keystone Literature Exam scores for students with

IEPs. However, the relatively small group size of students with IEPs ($n$ = 142) limits the

statistical power of the analysis and may prevent us from detecting small effects.  By

contrast, the relationship between unexcused English class period absences and Keystone

Literature Exam scores was significant for students in the non-IEP group ($\beta$ = -2.731, $t$ =

-8.68, $p$ < .001). Therefore, we can conclude that there was a relationship between

unexcused absences and Keystone Literature Exam scores for the non-IEP group. The $\beta$

coefficient tells us that for every one additional class period absent (unexcused), on

average, students in the non-IEP group were 2.7 points lower on Keystone Literature

Exam scores.

Table 12

*Linear Regression Results of Unexcused English Class Period Absences and Keystone Literature Exam Scores for IEP and Non-IEP Students*

|  | $\beta$ | SE | $t$ | $p$ |
| --- | --- | --- | --- | --- |
| IEP | -0.603 | .570 | -1.06 | .293 |
| Non-IEP | -2.731 | .315 | -8.68 | <.001 |

Figure 6 shows the difference in the regression lines for the two groups (IEP in blue versus non-IEP in green). There are many more non-IEP students (green data points) than IEP students (blue data points). The important pattern to note in the figure is that the regression line for the non-IEP students was significant and had a negative slope. The regression line for the IEP students did not have a significant slope. This suggests any relationship between unexcused English class period absences and Keystone Literature Exam scores for the IEP students was either small or insignificant. Notably, the regression line for non-IEP students began above the proficiency level and fell below proficiency somewhere between 1 and 10 absences, while the IEP students began and remained below the proficiency benchmark.
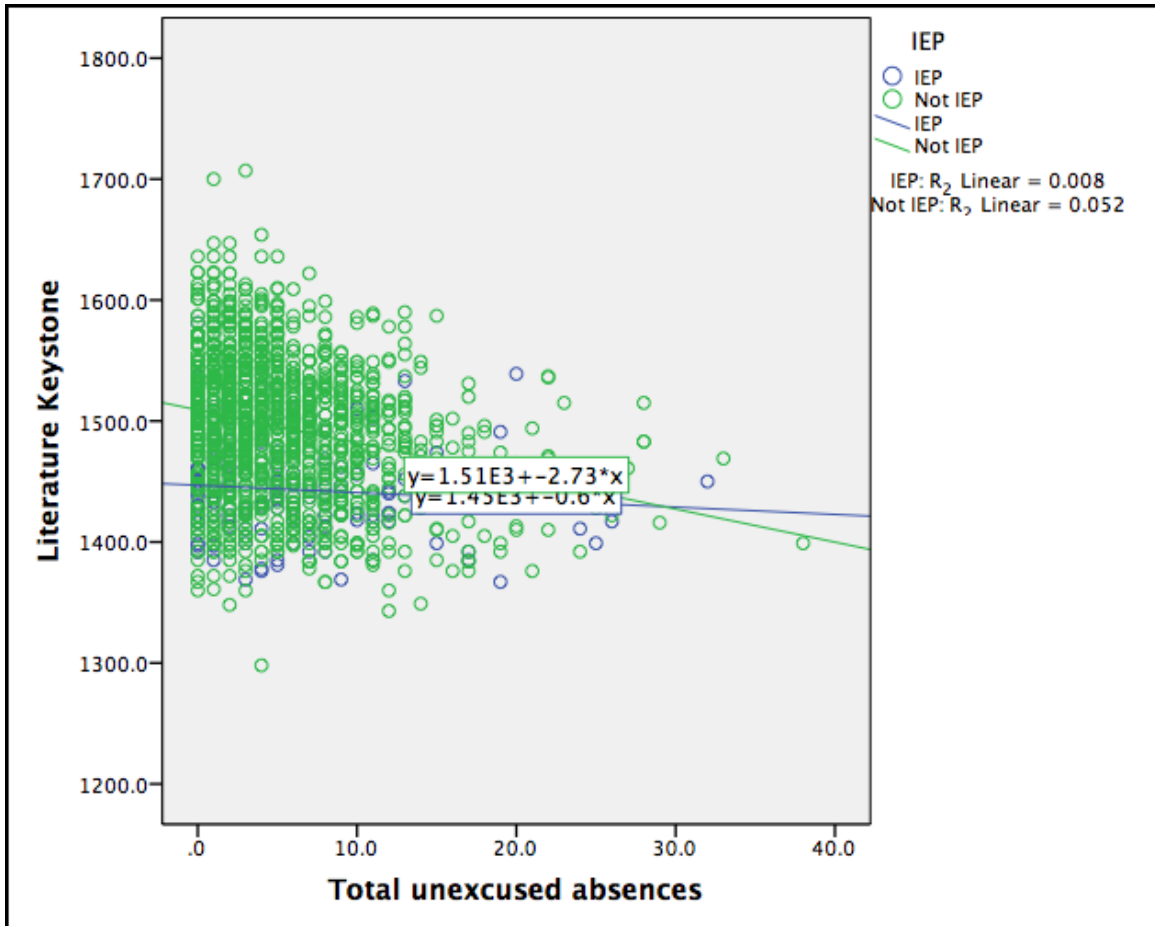
*Figure 6.* The figure shows the regression lines between unexcused English class period absences and Keystone Literature Exam Scores for IEP students (blue data points and blue regression line) and non-IEP students (green data points and green regression line).

**ELL.** For Sub-question 1c.iv, I conducted an ANCOVA to test whether the relationship between unexcused English class period absences and Keystone Literature Exam scores differed for ELL students (ELL code= 1, $n = 292$) versus non-ELL (non-ELL code = 0, $n = 1,256$) students. Displayed in Table 13, there were significant group differences as shown by the significant joint effect term (absences*ELL ($F[1] = 7.68$, $p = .006$) indicating the relationship between absences and test scores differed across language proficiency. Thus, the next step in the analysis was to conduct separate

87

regressions for the ELL students versus the non-ELL students. These separate regressions

allowed me to discern how the regression lines differed for the two groups.

Table 13

*ANCOVA Results for the Test of ELL Group Differences Between Unexcused English Class Period Absences and Keystone Literature Exam Scores*

| Source | $df$ | Mean Square | $F$ | $p$ |
|---|---|---|---|---|
| Model | 3 | 586,009.67 | 269.64 | <.001 |
| Absences | 1 | 78,696.16 | 36.21 | <.001 |
| ELL | 1 | 859,245.15 | 395.36 | <.001 |
| Absences * ELL | 1 | 16,688.62 | 7.68 | .006 |
| Error | 1,517 | 2,173.31 | | |

*Note. a. $R^2$ = .348 (Adjusted $R^2$= .346)*

Table 14 shows that the relationship between unexcused absences and Keystone

Literature Exam scores was significant and negative for students in the ELL group ($\beta$ = -

0.902, $t$ = -2.71, $p$ = .007). The $\beta$ coefficient tells us that for every additional unexcused

English class period absence, on average, students in the ELL group were 0.9 points

lower on Keystone Literature Exam scores. The relationship between unexcused English

class period absences and Keystone Literature Exam scores was also significant and

negative for students in the non-ELL group ($\beta$ = -2.443, $t$ = -8.04, $p$ < .001). The $\beta$

coefficient tells us that for every unexcused English class period absence, on average,

students in the non-ELL group were 2.4 points lower on Keystone Literature Exam

scores. Thus, there was a stronger negative relationship for non-ELL students than for

ELL students in regards to the relationship between unexcused English class period

absences and Keystone Literature Exam scores.

Table 14

*Linear Regression Results of Unexcused English Class Period Absences and Keystone Literature Exam Scores for ELL and Non-ELL Students*

|  | $\beta$ | *SE* | *T* | *p* |
|---|---|---|---|---|
| ELL | -.902 | .333 | -2.71 | .007 |
| Non-ELL | -2.443 | .304 | -8.04 | <.001 |

As shown in Figure 7, the regression line for the relationship between unexcused English class period  absences and Keystone Literature Exam scores was slightly (and significantly) steeper for Non-ELL students (green regression line) than for ELL students (blue regression line). The regression line for non-ELL students began above the proficiency level and fell below the benchmark between 1 and 10 absences, while the regression line for ELL students began and remained below the proficiency level. Consistent with the prior analyses, both regression lines had negative slopes, but there was an on average greater point loss per day for the group that started with higher mean test scores.
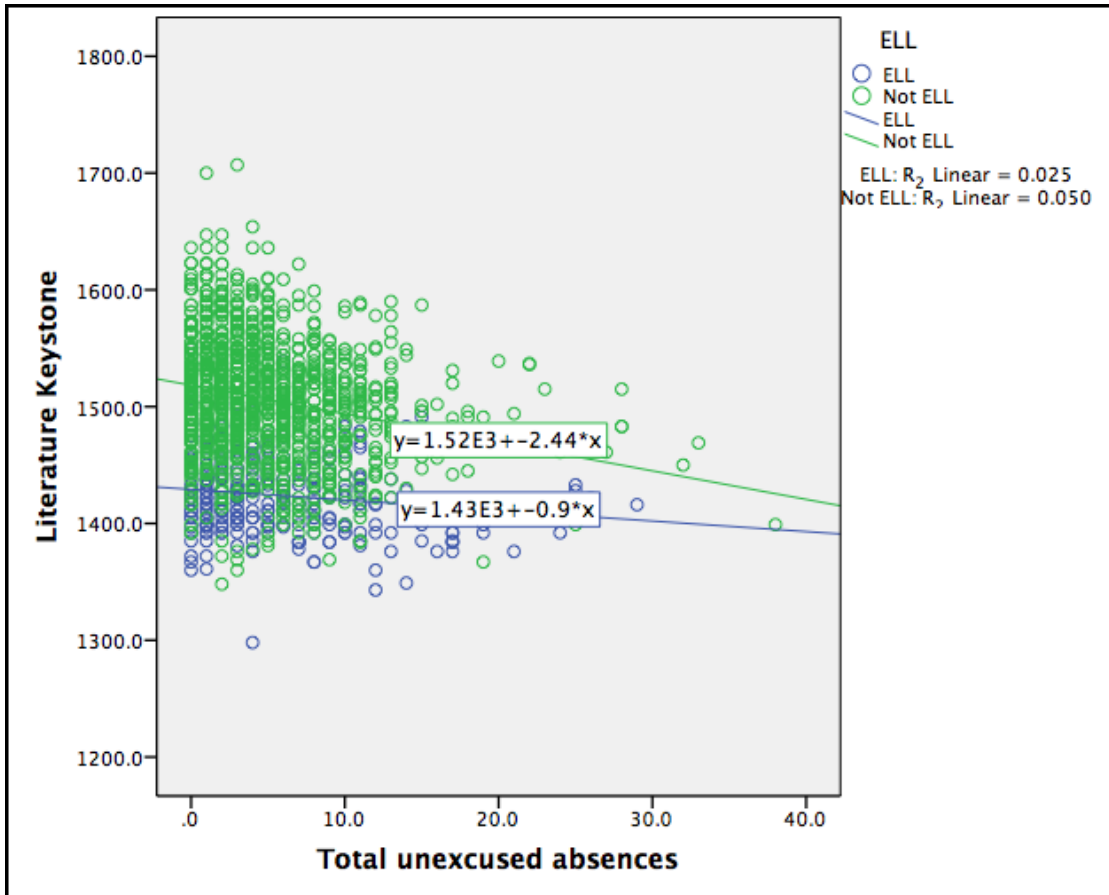
*Figure 7.* The figure shows the regression lines between unexcused English class period absences and Keystone Literature Exam Scores for ELL students (blue data points and blue regression line) and non-ELL students (green data points and green regression line).

**ED.** For Sub-question 1c.v, I conducted an ANCOVA to test whether the

unexcused English class period absences/Keystone Literature Exam score relationship

differed for economically disadvantaged (ED) students (ED code = 1, $n$ = 1,006) versus

non-economically disadvantaged (non-ED) students (non-ED code = 0, $n$ = 545). As

shown in Table 15, the relationship between unexcused English class period absences and

Keystone Literature Exam scores differed across economic advantage, as shown by the

significant joint effect term (absences*ED ($F[1] = 4.68$, $p < .031$). Thus, the next step in

the analysis was to conduct separate regressions for the ED students versus the non-ED

students. These separate regressions allowed discernment on how the regression lines differed for the two groups.

Table 15

*ANCOVA Results for the Test of ED Group Differences Between Unexcused English Class Period Absences and Keystone Literature Exam Scores*

| Source | Df | Mean Square | F | p |
|--------|-----|-------------|-------|-------|
| Model | 3 | 244,913.71 | 85.99 | <.001 |
| Absences | 1 | 128,450.20 | 45.11 | <.001 |
| ED | 1 | 302,218.36 | 106.12 | <.001 |
| Absences* ED | 1 | 13,317.76 | 4.68 | .031 |
| Error | 1,517 | 2,847.85 | | |

*Note. a. $R^2 = .145$ (Adjusted $R^2 = .144$)*

As shown in Table 16, the relationship between unexcused English class period absences and Keystone Literature Exam scores was significant and negative for ED students ($p < .001$). The unstandardized regression coefficient was -1.649. Therefore, for every class period increase in unexcused English class period absences, there was a 1.6 point decrease on Keystone Literature Exam scores. The relationship between unexcused English class period absences and Keystone Literature Exam scores was also significant and negative for non-ED students ($p < .001$). The unstandardized regression coefficient was -3.216. Consequently, for every class period increase in unexcused English class period absences, there was a 3.2 point decrease on the mean Keystone Literature Exam score.

Table 16

*Linear Regression Results of Unexcused English Class Period Absences and Keystone Literature Exam Scores for ED and Non-ED Students*

|        | $\beta$ | SE   | $t$   | $p$    |
|--------|---------|------|-------|--------|
| ED     | -1.649  | .319 | -5.17 | <.001  |
| Non-ED | -3.216  | .646 | -4.98 | <.001  |

As shown in Figure 8, the regression line for the relationship between unexcused English class period absences and Keystone Literature Exam scores was slightly (and significantly) steeper for non-ED students (green regression line) than for ED students (blue regression line). The regression line for non-ED students began above the proficiency level and the regression line for ED students began slightly below the proficiency level with both regression lines displaying a significant negative slope. Similar to the prior analysis, the group with higher mean tests scores at zero absences showed greater score declines per absence.
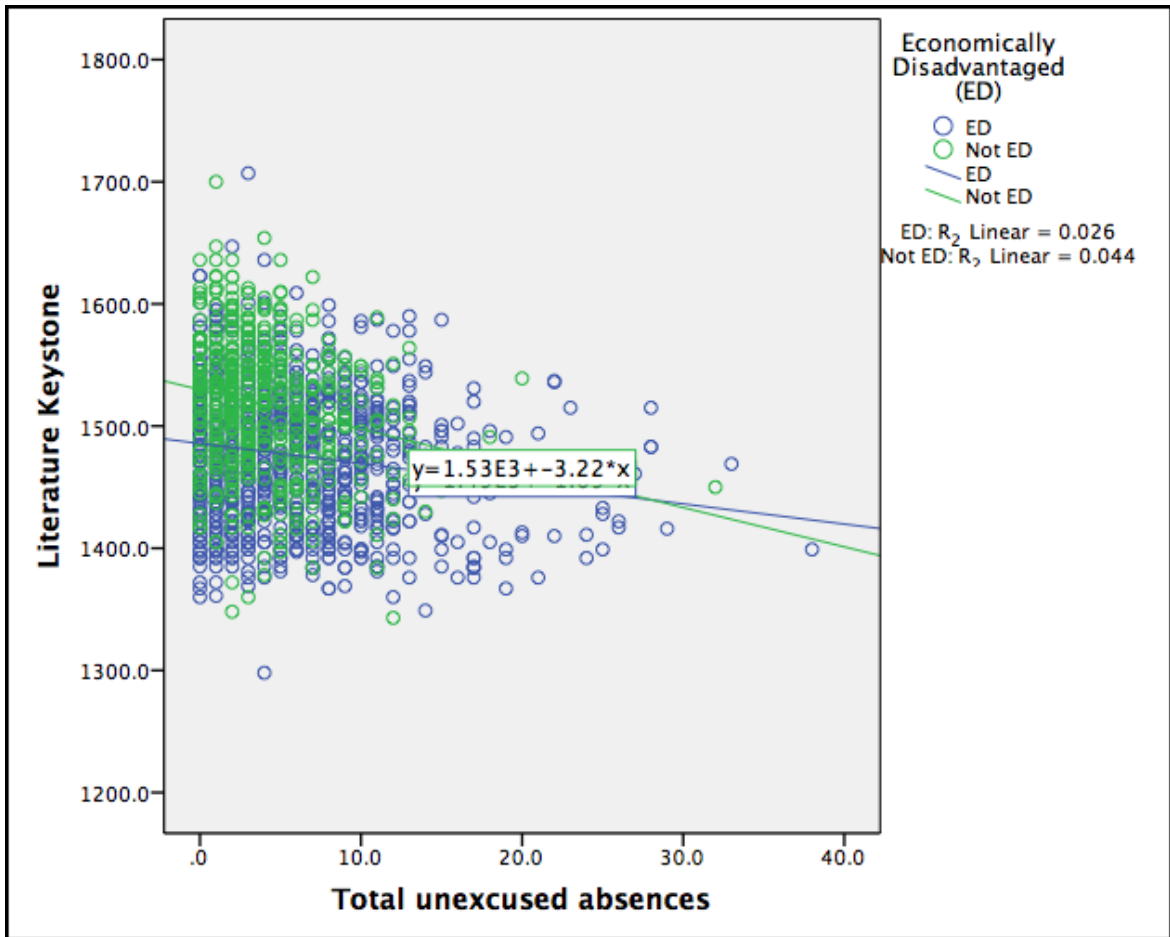
*Figure 8.* The figure shows the regression lines for the relationship between unexcused absences and Keystone Literature Exam Scores for ED students (blue data points and blue regression line) and non-ED students (green data points and green regression line).

**Prior Achievement.** The analysis of Sub-question 1c.vi relied on a hierarchical linear regression to analyze the relationship between unexcused English class period absences and Keystone Literature Exam scores after controlling for prior achievement, the predictor variables in Sub-questions 1c.i to 1c.v (Building, Ethnicity, ELL status, IEP status and ED status), and the variables gender, testing semester, grade and age at testing. While Sub-questions 1c.i to -1c.v isolated variables of interest to compare the differences, if any, between groups in relation to unexcused English class period absences and Keystone Literature Exam scores, hierarchical regression allows for a comparison of

multiple variables of interest.  Students' 8th grade PSSA Reading and Writing scores served as the predictor variable of prior achievement.  The higher of the two PSSA scores served as the variable in the analysis, allowing for students missing one score to still be included in the analysis.

As shown in Table 17, there were 1,245 students, 80.3%, with prior achievement data and 306 students, 19.7%, with missing data that were excluded from the hierarchical linear regression analysis.  Of students excluded from analysis, 74.2% were Hispanic, whereas the sample was 46.8% Hispanic.  Over half of the students missing prior achievement data, 51.3%, were ELLs and only 19.0% of the sample were ELL. In addition, 16.3% of the student group missing data also violated the district attendance policy and only 8.8% of the sample violated the attendance policy.  This mirrors prior research indicating many student attendance issues manifest in elementary and middle school and continue into high school (Silvestri, 2003; Credé, Roch & Kiesczynka, 2010; Attendance Works, 2014).

Table 17

*Frequencies and Percentages of Students with or without Prior Achievement Data in Each Demographic Category*

| Variable | % | High School | % | PSSA Data | % | No Data |
|---|---|---|---|---|---|---|
| Total | 100.0 | 1,551 | 80.3 | 1,245 | 19.7 | 306 |
| Gender | | | | | | |
| Female | 50.2 | 779 | 49.9 | 621 | 51.6 | 158 |
| Male | 49.8 | 722 | 50.1 | 624 | 48.4 | 148 |
| Ethnicity | | | | | | |
| White | 51.0 | 791 | 57.8 | 720 | 23.2 | 71 |
| Hispanic | 46.8 | 726 | 40.1 | 499 | 74.2 | 227 |
| Black | 1.4 | 21 | 1.2 | 15 | 2.0 | 6 |
| Multi-racial | 0.5 | 8 | 0.5 | 6 | 0.7 | 2 |
| Asian | 0.3 | 5 | 0.4 | 5 | 0.0 | 0 |
| IEP | | | | | | |
| Not IEP | 90.8 | 1,409 | 90.4 | 1,125 | 92.8 | 284 |
| IEP | 9.2 | 142 | 9.6 | 120 | 7.2 | 22 |
| ELL | | | | | | |
| Not ELL | 81.0 | 1,256 | 88.9 | 1,107 | 48.7 | 149 |
| ELL | 19.0 | 295 | 11.1 | 138 | 51.3 | 157 |
| ED | | | | | | |
| Not ED | 35.1 | 545 | 37.4 | 466 | 25.8 | 79 |
| ED | 64.9 | 1,006 | 62.6 | 779 | 74.2 | 227 |
| Grade | | | | | | |
| 9 | 1.2 | 19 | 1.3 | 16 | 1.0 | 3 |
| 10 | 89.0 | 1,360 | 95.5 | 1,189 | 62.4 | 191 |
| 11 | 9.8 | 152 | 3.2 | 40 | 36.6 | 112 |
| Testing Semester | | | | | | |
| 1 | 42.2 | 655 | 41.9 | 522 | 43.5 | 133 |
| 2 | 57.8 | 896 | 58.1 | 723 | 56.5 | 173 |
| Policy Violation | | | | | | |
| No | 91.2 | 1,414 | 93.0 | 1,158 | 83.7 | 256 |
| Yes | 8.8 | 137 | 7.0 | 87 | 16.3 | 50 |
| Building | | | | | | |
| College Prep | 46.8 | 726 | 40.9 | 509 | 70.9 | 217 |
| Career Prep | 36.8 | 570 | 40.0 | 498 | 23.5 | 72 |
| STEM | 16.4 | 255 | 19.1 | 238 | 5.6 | 17 |

As displayed in Table 18, Sub-question 1c.vi utilized hierarchical linear regression which included three models.  Model 1, utilized the predictor variable of prior achievement data (PSSA Reading or Writing Exam scores) only.  Model 2 added the predictor variables semester, gender, grade, building, IEP status, ED status, age at testing, ethnicity and ELL status, into the regression analysis.  Model 3 added the predictor variable of unexcused English class period absences to the regression analysis.  Keystone Literature Exam scores served at the outcome variable.

Table 18

*Hierarchical Linear Regression Analysis Predicting Keystone Literature Exam Scores from Prior Achievement, Demographic Variables and Unexcused Absences*

|  | Hierarchical | |
| --- | --- | --- |
| Variable | $\Delta R^2$ | St. $\beta$ |
| Model 1: Prior achievement | .679 | .824 *** |
| Model 2 | .016 | |
| Building | | .033 * |
| Gender | | -.068 *** |
| Ethnicity | | .023 |
| IEP | | .054 ** |
| ELL | | .049 * |
| ED | | .014 |
| Age at testing | | -.035 * |
| Grade | | .003 |
| Semester | | -.041 * |
| Model 3: Unexcused Absences | .001 | -.036 * |

*Note.* *** $p \le .001$, ** $p \le .01$, * $p \le .05$

Each level of the hierarchical linear regression was significant.  However, 68% of the variance in Keystone Literature Exam scores could be explained by prior achievement (PSSA Reading or Writing Exam scores).  Model 2, which included the addition of all predictor variables except that of unexcused English class period absences, added an

additional 1.6% of explanation towards the variance in Keystone Literature Exam scores.

Model 3, which included that of unexcused English class period absences, explained an

additional 0.1% of the variance in Keystone Literature Exam scores.  These results

suggest that the effects of unexcused absences in high school can be largely explained by

prior academic achievement.

**Summary of Findings Question 1.** Questions 1a-1c examined the relationship

between the total number of both excused and unexcused English class-period absences

in relation to Keystone Literature Exams scores.  The total number of unexcused

absences could explain 3.8% of the variance in Keystone Literature Exam scores and

unexcused absences could explain 5.1% of the variance.  The relationship between that of

excused English class-period absences and Keystone Literature Exam scores was not

significant.

When examining the differences between the attendance and achievement

relationship, as pertaining to Sub-questions 1c.i to 1c.v, students in the STEM building,

as opposed to those students in the college preparatory and career and technical

preparatory buildings, were not significantly different.  The relationship was significantly

different, however, for white versus non-white students, ELL versus non-ELL students,

IEP versus non-IEP students and ED versus non-ED students.  All relationships were

significant and negative.  White, non-ELL, non-IEP and non-ED students lost more

points per unexcused absence than the students in their corresponding comparison group.

However, these groups all outperformed their comparison group in Keystone Literature

Exam scores perhaps indicating students with higher scores to begin with are subject to

greater declines when they miss school or that the Keystone exam is less able to detect differences in performance as student scores edge closer to the test floor of 1,200 points.

Sub-question 1c.vi, through isolated and combined regression analyses, discovered that prior achievement (PSSA Reading or Writing Exam scores) could explain 68% of the variance in Keystone Literature Exam scores. When added to the analysis, all demographic variables only added an additional 1.6% of explanation in terms of the variance. Unexcused English class period absences could only explain an additional 0.1% of the variance in scores, thus indicating the significant negative relationship between absences and exam scores was mostly accounted for by prior academic achievement.

**Question 2**

*Is the relationship between unexcused English class period absences and achievement (Keystone Literature Exam scores) different for students who violate the attendance policy (eight or more unexcused English class period absences per quarter) versus those who do not violate the attendance policy?* Question 2 relied on a regression discontinuity (RD) analysis to determine if the achievement/absenteeism link differed for students who violated the attendance policy versus those who did not violate the attendance policy. Students with seven or fewer unexcused English class period absences did not violate the attendance policy; students with eight or more unexcused English class period absences did violate the attendance policy. Thus, the RD analysis focused on the cutoff point of seven (and lower) versus eight (and higher) unexcused English class period absences (Baker, Smolkowski, Chaparro, Smith & Fien, 2015; Smolkowski, Strycker, & Seely, 2013; Trochim & Donnelly, 2008; Shaddish, Cook, & Campbell,

2002).  I completed analyses by using a scatter plot to diagram Keystone Literature Exam

scores on the Y axis and number of unexcused English class period absences, for the

quarter prior to the Keystone Literature Exam, on the X axis.  These diagrams differed

from the linear regression (OLS) utilized in question one, that included a cutoff line

which represented the violation of the attendance policy and regression lines for students

who violated the attendance policy and those who did not. I completed an analysis for

question two that consisted of the individual student data from Keystone Literature Exam

scores and the corresponding attendance data.   I combined all individual student

attendance data and Keystone Literature Exam scores, from the 2013-2015 school years,

due to the fact that each semester includes different students, all first-time testers, taking

the Keystone Literature Exam.

  According to Smolkowski, Chaparro, Smith and Fien (2015), "RD design and

analysis use a single score on a continuous assignment variable to determine the

dichotomous treatment indicator" (p.228).  The number of unexcused English class

period absences served as the assignment and predictor variable.  The "assignment

variable may be any variable measured before treatment" (Shaddish, Cook, & Campbell,

2002, p.209).  The treatment indicator was the violation of the attendance policy, where

eight unexcused English class period absences was the inflection point of the

discontinuity portion of the regression, which per policy requires students to receive a

failing grade for class participation. Class participation constitutes 25% of their final

grade.  The outcome variable was Keystone Literature Exam scores.  RD examined if the

slope of the regression was significantly different for students who had fewer than eight

unexcused English class period absences versus those who had eight or more unexcused English class period absences, which violates the attendance policy.

**Results Question 2**

Figure 9 shows the relationship between the predictor, the number of unexcused English class period absences, and the outcome, Keystone Literature Exam scores, with blue markers for non-violators and green markers for policy violators. There was no discontinuity between students with seven (or fewer) and eight (or more) unexcused English class period absences.
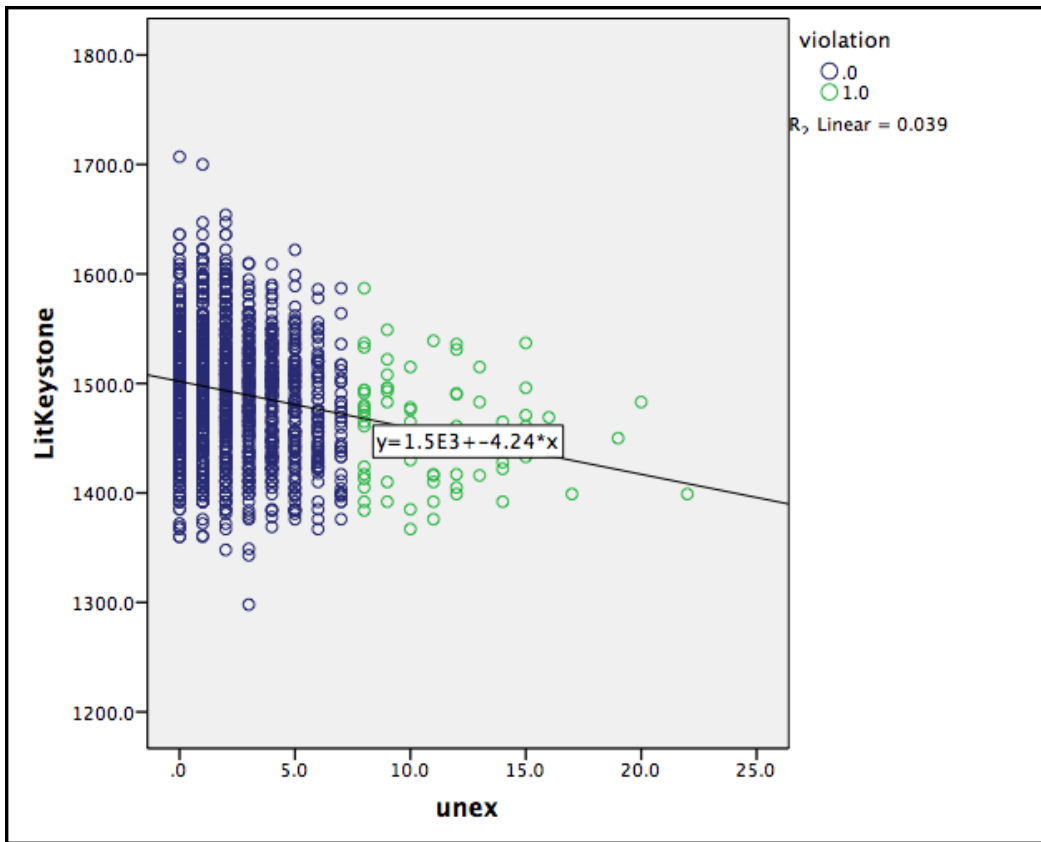


*Figure 9.* These data represent a scatter plot of non-violators and violators of the attendance policy.

The equation for the regression line is as follows:

$$y = 1.5E3 - 4.24*x$$

The intercept for the regression line (the place where it hits the Y or vertical axis and where X = 0) was slightly above the 1,500 mark ($1.5E3 = 1.5*10^3 = 1.5*1000 = 1500$, within rounding error). The slope of the regression line was -4.24. For every one unit (one English class period) increment in unexcused English class period absences, there was a corresponding 4.24 point decrease in the Keystone Literature Exam score. Based on the scatterplot, there does not appear to be a discontinuity at the cut-point of eight unexcused English class period absences, the place on the X axis that divides the non-violators (blue markers) and the policy violators (green markers). However, sometimes a discontinuity is masked by the variation in the data. Thus, a follow-up regression-discontinuity (RD) analysis was conducted for a more precise test of discontinuity.

In conducting the RD analysis, I transformed the values of the predictor (number of unexcused English class period absences) so that the intercept was set equal to the cut-point of eight. This transformation entailed subtracting eight from each student's covariate score as follows:

$$x = x_i - x_c$$

$$x = x_i - 8$$

The scatterplot of the relationship between the transformed predictor, unexcused English class period absences minus eight, and the outcome, Keystone scores, is given in Figure 10. The non-violators are marked in blue; the policy violators are marked in green. The intercept for the regression line (the place where it hits the Y axis when X = 0) was at approximately the 1470 mark ($1.47E3 = 1.47*10^3 = 1.47*1000 = 1470$, within rounding error). Notice the intercept has been adjusted by eight units on the X axis (eight

101

days of unexcused English class period absences). The slope (-4.24) was unaffected by the transformation. The equation for the new regression line was as follows:

$$y = 1.47E3 - 4.24*x$$

The mathematical transformation of the intercept in Figure 8 (~1500) to the intercept in Figure 10 was computed as follows:

$$1500 - 8(4.24) = 1470 \text{ (within rounding error)}$$
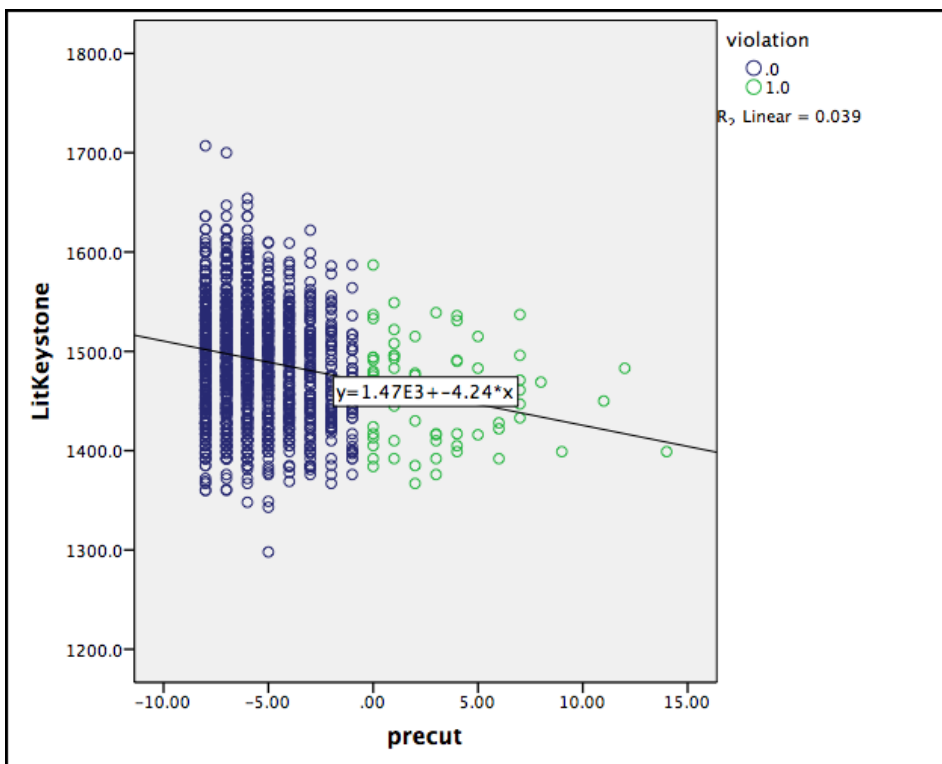


*Figure 10.* These data represent a scatter plot of non-violators and violators of the attendance policy for the adjusted values.

The only change from Figure 9 to Figure 10 was that the intercept of the regression line has been moved from zero unexcused absences to the point on the X axis representing eight unexcused English class period absences. Notice this point is labeled 0 in Figure 9 because of the transformation step noted above in which the analyst

102

subtracted eight points from each covariate score. Based on visual inspection, the regression line appears to be continuous in Figure 10. However, I conducted a more precise test of discontinuity by applying an RD analysis.

**Test of differences in slopes.** To test whether the slope of the regression line differed for the policy violators and the non-violators, I regressed the outcome variable, Keystone Literature Exam scores, on the grouping variable, the dummy variable identifying group (0 = policy violator, 1 = non-violator; labeled as "violation" in the RD model), the transformed variable for number of unexcused English class period absences (aka precut) and the joint effects of the two predictors. The results are presented in Table 19. The interaction of the transformed predictor (aka precut $p<.203$) and the grouping variable (aka violation) was not significant. The interpretation of this finding was that the slopes of the regression lines for the policy-violators and the non-violators were not significantly different.

Table 19

*Test of Different Slopes between Policy Violators and Non-Policy Violators*

| Source | Df | Mean Square | F | p |
|---|---|---|---|---|
| Model | 3 | 68,214.71 | 21.34 | <.001 |
| Precut | 1 | 197,059.87 | 61.63 | <.001 |
| Violation | 1 | 2,403.25 | 0.75 | .386 |
| Precut * violation | 1 | 5,181.01 | 1.62 | .203 |
| Error | 1,517 | 3,197.29 | | |

*Note.* a. $R^2 = .040$ (Adjusted $R^2 = .039$)

**Test of Policy Variable.** The next logical step was to drop the interaction term from the model and to test whether the policy violation variable was a significant predictor of the Keystone Literature Exam scores. A significant finding would indicate

that the regression line was discontinuous at the cut-point (labeled 8 on the X axis of

Figure 9 and 0 on the X axis of Figure 10). A non-significant finding would indicate that

the regression line was continuous at the cut-point, and thus the policy was not a

significant predictor of Keystone Literature Exam scores after controlling for the

predictor (number of unexcused English class period absences). The results are presented

in Table 20.

Table 20

*Test of Policy Violation Variable*

| Source | Df | Mean Square | F | p |
|---|---|---|---|---|
| Model | 2 | 99,731.56 | 31.18 | <.001 |
| Precut | 1 | 197,059.87 | 61.61 | <.001 |
| Violation | 1 | 2,403.25 | 0.75 | .386 |
| Error | 1,518 | 3,198.60 | | |

*Note.* a. $R^2 = .039$ (Adjusted $R^2 = .038$)

As shown by the coefficient (*p<.386*) in Table 20, violation was not significantly

linked to Keystone Literature Exam scores after controlling for the number of unexcused

English class period absences ($p = .386$, $\alpha = .05$). Thus, the intercept of the regression

line in Table 20 (and in Figure 10) was the same for policy violators (y = 1,470) and non-

violators (y = 1,470). There was no discontinuity in the regression line at the cut point.

The absenteeism policy was not linked to improvements or losses on Keystone Literature

Exam for either the policy violators nor for the non-violators.

**Summary of Findings Question 2**

This part of the results provided an analysis of the site attendance policy.

According to this policy, students with eight unexcused English class period absences

received a failing grade in class participation. There were no statistically significant

differences in the Keystone Literature Exam scores at the cut-off point of eight

unexcused absences for policy violators and non-policy violators.  The regression line

was continuous along the full range of the X-axis, which measures the number of English

class period absences. For the sample, the Keystone Literature Exam scores decreased by

4.24 points for each English class period absence.  The regression discontinuity results

revealed that policy violation was not a significant predictor of Keystone Literature

Exam.

# CHAPTER 5

## Discussion and Implications

This study sought to investigate the relationship between attendance and achievement in an urban high school setting, as it specifically examined the differences between excused and unexcused class period absences in a course prior to the state assessment. The study examined differences between the attendance and achievement relationship pertaining to students in different high school buildings, ethnic minorities, special education students, English Language Learners, and economically disadvantaged students. In addition, the current study examined the relationship between achievement and the mandates of an attendance policy. Through statistical analysis of 1,551 students' attendance and achievement data, the study revealed information about the attendance and achievement relationship specific to individual student class-period attendance. This chapter discusses the notable findings, highlights the study's strengths and limitations, interprets the implications of the findings, and provides recommendations for future practice and research related to student attendance and absenteeism.

## Notable Findings

Through an exploration of the research questions, the study uncovered findings concerning the attendance and achievement relationship when examining individual class period attendance as pertaining to an English II class, which was prior to the Keystone Literature Exam. The results indicated that both unexcused English class absences and total absences (excused and unexcused) were predictors of Keystone Literature Exam scores, while excused absences on their own were not. While both significant predictors, prior achievement accounted 68% of the explanation of exam scores and unexcused

absences only accounted for 0.1% of the exam scores.  Analysis of the research site's attendance policy showed no significant differences between Keystone Literature Exam scores at the cutoff point of the policy. The results, therefore, indicated students who violated the site's attendance policy did not differ significantly on their Keystone Literature Exam scores from students who did not violate the attendance policy.

## Strengths and Limitations of the Study

The purpose of the current study was to further analyze the relationship between attendance and achievement by expanding upon the current body of literature through the examination of individual student class period attendance and achievement.  A strength of the current study was the inclusion of individual class period attendance, as opposed to daily averages, in the course prior to state assessment.  Because students in a high school setting attend various courses throughout their school day, studies of achievement and attendance gain accuracy from noting specifically which courses students are missing. In addition, the study analyzed a large sample of diverse high school students, including ethnic minorities, English Language Learners, economically disadvantaged students, and IEP students.  This further contributed to the body of literature in this area by further analyzing the attendance and achievement relationship, which had significant differences between the comparison groups, for these groups of students.

Beyond the implications for the advancement of research concerning the relationship between attendance and achievement, the current study modeled methodology for school entities, regardless of state or country, by incorporating a research design that specifically analyzed individual student attendance and achievement

data.  However, state assessments merely provide a snapshot of student performance on a particular day, not a holistic view of their performance, in general.

Despite the goals of the current study to analyze the relationship between individual class period attendance and achievement in an urban high school setting, limitations were present.  The research site was a large urban high school, which contained three separate buildings, all managed by one individual principal. Despite the three buildings, all students were part of a student body that comprised one urban high school.  Therefore, the unique nature of the research site limits the generalizability of the study to other school contexts.

Despite the fact that the current study provides a model for school districts to analyze attendance and achievement data, the analysis of prior achievement data underestimated the link between unexcused absences and Keystone Literature Exam scorers.   Analysis revealed that prior achievement accounted for 68% of exam scores and unexcused absences accounted for 0.1%.  Due to the fact that prior achievement encompasses the cumulative effects of a student's attendance and achievement data, the percentage of variance accounted for by unexcused absences may have in reality been higher (Gottfried 2009, 2010, 2014).

In addition, a portion of the student population at the research site was transient. The transient population not only encompassed students moving from state to state and from city to city, but a large number of students enrolled in the school setting moved from different countries, with a large portion coming from the Dominican Republic.  This contributed to the large portion of missing 8th grade PSSA Reading and Writing scores for the sample.  In a similar manner, transiency and missing data prohibited the current

study from considering student elementary and 5 middle school attendance as a contributing factor. Prior studies have shown the relationship between absenteeism, in as early as kindergarten, and negative relationship with high school achievement (Connolly & Olsen, 2012; Ehrlich, Gwynne, Stitziel Pareja, Allensworth, Moore, Jagesic, & Sorice, 2014; Balfanz, Herzog, & MacIver, 2007).

Finally, in addition to the lack of analysis on prior achievement and attendance, other unobservable variables and/or unstudied variables could have influenced the results of the study. As prior research demonstrated (Balfanz & Byrnes, 2012; Eaton, Brener & Kann, 2008; Henry, 2007; Gottfried, 2010, 2014), many other variables contribute to a student's daily decision if he or she will be absent from school: school, community, family, health, behavior. Thus, the five variables examined by the current study— ethnicity, building assignment, socioeconomic status, ELL status, and IEP status—are only a few of the factors related to attendance and achievement.

## Discussion

The statistical tests found significant differences in the effects of excused and unexcused absences. Students in the sample had a higher number of unexcused English class period absences versus excused English class period absences, as excused absences require approved documentation. Gottfried (2013) in a study of urban schools also found that students had more unexcused absences, but the data was aggregated for the school year as opposed to class period attendance.

Before controlling for prior achievement, linear regression (OLS) analysis revealed that unexcused English class period absences were a significant predictor of Keystone Literature Exam scores, which decreased by an average of 13.24 points for

every five unexcused class period absences.  There was no similar relationship between excused English class period absences and Keystone Literature Exam scores. These findings align with Finlay's (2006) and Gottfried's (2009, 2013) studies, which found that students with more excused absences performed better than students with an increased number of unexcused absences.  They also noted a reduction in achievement with an increase in unexcused absences (Finlay, 2006; Gottfried, 2009, 2013).  However, these findings should not be interpreted as indicators that excused absences are of no harm to the student because they are still missing learning opportunities, regardless of the reason for the absence (Chang & Balfanz, 2016).

The current study's finding that the relationship between unexcused English class period absences and Keystone Literature Exam scores did not differ for students in the STEM building versus students in the college preparatory and career preparatory buildings, indicated that the findings were consistent across all buildings, despite their differing student populations.  Notably, the STEM school is by application only for high achieving students in sciences and mathematics. Therefore, the consistency in the attendance and achievement relationship across buildings implies that the negative relationship between unexcused absences and achievement affects both high achieving students and their lower achieving peers.

Consistency within the current study's findings across buildings does not imply that results were consistent across all student groups. In fact, White versus non-White, IEP versus non-IEP, ELL versus non-ELL and ED versus non-ED comparisons did show significant differences in the negative effects of unexcused absences on literature exam scores. It may seem surprising that the relationships were most significant and negative

110

for White, non-IEP, non-ELL and non-ED students, who on average lost a larger number of points per unexcused class period absence relative to their comparison groups. However, the larger point loss for the aforementioned groups could be due their regression lines beginning above the minimum proficiency level of 1,500, whereas the regression lines for the comparison groups began below the proficiency level, indicating the higher achieving students simply had more points to lose or that the tests were less adept at detecting differences in performance at the lower levels of achievement. Despite the differences in the size of the effects, most comparison groups' Keystone Literature Exam scores decreased significantly as unexcused class period absences increased. The lone exception was students with IEPs, who, in turn, showed no significant relationship between unexcused absences and exam scores.

Upon examination of each sub-group's scatter plot, the non-white, non-IEP, non-ELL and non-ED groups had a large portion of scores at the bottom of the plots indicating the possible presence of the floor effect (Shaddish, Cook & Campbell, 2002). This presence of the floor effect would indicate that students in these groups maxed out with the lowest scores possible. This would cause an underestimation in the points lost per absence for these groups of students. If these students did not max out at the lowest possible score; their scores in reality would be lower and their relationship with their comparison group would be an underestimation.

Students with an IEP were the only subgroup that did not have a significant relationship with unexcused class period absences and Keystone Literature Exam scores. IEP students have the potential to struggle academically their entire academic careers, and by the time they reach high school, they have significant gaps in their knowledge

111

acquisition (Balfanz & Byrnes, 2012; Bohrnstedt, Kitmitto, Ogut, Sherman & Chan, 2015; Haycock, 2001; Ready, 2010). This lack of significant relationship could be due to the fact that students' gaps in knowledge are so large by the time they reach high school that increased absences do not have a significant relationship upon achievement (Balfanz & Byrnes, 2012; Bohrnstedt, Kitmitto, Ogut, Sherman & Chan, 2015; Haycock, 2001; Ready, 2010). The results of the hierarchical regression identifying prior achievement as the most important factor in exam scores supports this hypothesis. However, the lack of a significant relationship between absences and test scores could also be a testament to the efficacy of the targeted supports offered to students with IEPs. Fully understanding the reasons behind these results is beyond the scope of the current study and would require further targeted exploration.

The findings that prior achievement primarily explained differences in exam scores may seem to counter-intuitively suggest that student attendance does not matter. However, prior research indicated an intertwined relationship between attendance and achievement in early grades had lasting impact throughout a student's education career (Silvestri, 2003; Credé, Roch & Kiesczynka, 2010; Attendance Works, 2014). Although this study did not analyze elementary and middle school attendance data, a large portion of explainable variance, attributed to $8^{th}$ grade prior achievement, directly aligns with attendance and achievement data indicating the relationship between past and current student performance (Silvestri, 2003; Credé, Roch & Kiesczynka, 2010; Attendance Works, 2014). Without further information, I can only hypothesize that low achieving students may miss more school or that students who miss large amounts of school in high

school reflect a pattern of chronic absences with cumulative negative effects on academic achievement over time.

Although data from research question explored the relationships between absences and achievement, the second research question revealed a lack of efficacy in the research site's attendance policy. The school board at the research site imposed a failing grade in class participation for students missing more than eight unexcused class period absences. Board policy #204 rests on two assumptions: (1) a threat of academic failure deters students from missing eight or more class period absences, and (2) the cut-off point of eight unexcused class period absences has a particular relationship to academic achievement. The study found no discontinuity between those students who attain seven or fewer unexcused English class period absences with those students attaining eight or more unexcused English class period absences, suggesting that there may be a lack of a deterrent effect. In addition, the regression lines pertaining to policy violators versus non-violators were not significantly different, suggesting a lack of achievement effects. The insignificant score differences at the point of policy imposition undermines both assumptions underpinning the attendance policy and suggests the policy punishes students at an arbitrary cutoff point with no discernable effects. In addition there was not a drop in student absences at six or seven absences, which suggests that the policy was not serving as a deterrent to student absences.

Prior studies do not seem to form a general consensus on a particular number of days absent from school that is least harmful to student success (Ginsberg, Jordan, & Chang, 2014; Roby, 2004). However, studies did agree that over three unexcused absences was related to a significant reduction in achievement (Allensworth & Easton,

113

2007; Ginsberg, Jordan, & Chang, 2014; Hixton, 2012; NCES, 2009a), supporting the current study's findings regarding a lack of discontinuity between seven and eight unexcused class period absences.

## Recommendations for Practice, Policy, and Research

The current study contributed to the existing body of literature that focused on the relationship between attendance and achievement in the high school setting. This particular study aligned with prior research concerning the significant relationship between unexcused absences and achievement with standardized assessment scores dropping as unexcused class period absences increased (Finaly, 2006; Gottfried, 2009,2010). Based upon the findings from prior research, the current study revealed the same patterns are present in average daily attendance as well as class period attendance. Analysis of a punitive approach to attendance revealed no significant differences in student achievement for policy violators versus non-violators.

Considering the well-documented negative relationship between absenteeism and achievement in the current study and prior work (Balfanz & Byrnes, 2013; Ginsberg, Jordan, & Chang, 2014; Roby 2004), practitioners should heed the advice of the National Center for Education Statistics (2009b) and collect high quality, historical attendance data. School personnel should also examine attendance data on an individual student level to look for patterns (Chang & Balfanz, 2016) that may be of use in designing interventions and assisting in providing support at an early stage. Due to the attention on attempts made in closing the achievement gap of historically underperforming groups of students, school officials have an increased focus on these groups of students. However, based on the results of the current study, school administration must equally focus on all

groups of students due to the fact that those groups of students that are not of special

focus are actually losing more points on a daily basis per absence.

Because the reasons for non-attendance are complex, practical interventions to

improve student attendance should incorporate a number of factors. One avenue includes

informing parents of the importance of student attendance and assisting parents in

practical solutions to increase achievement (Chang & Romero, 2008).  Chang and

Romero (2008) also suggested preventative health care, instruction that meets the needs

of diverse learners, attendance incentives, and parent education as a means of preventing

attendance problems before they begin.  In addition, the Youth Justice Board (2013)

recommended interventions for those students in the greatest need regarding school

attendance, as well as after school programs, and action plans for students returning to

school from extended absences. *Attendance Works*, sponsored through John Hopkins

University, proposed student connections with a mentor (Chang & Balfanz, 2016) which

administrators implemented in New York City Public Schools (Youth Justice Board,

2013).  Furthermore, Chang and Romero (2008) suggested that school entities work with

outside agencies in assisting struggling students and families.

The current study also has implications for policy makers. In light of the lack of

evidence regarding the efficacy of the research site's attendance policy, the board should

consider aligning their attendance policy with the state of Pennsylvania's 2016 revision in

the compulsory attendance laws with the passing of Act 138 (PDE, 2015b).  The new law

is less punitive and requires that multiple measures take place before legal action against

the parent occurs.  The concept of less punitive is key as the site's attendance policy was

arbitrarily punishing low-achieving students with an even lower grade.  Absences are

cumulative, and not only must parents attend a Student Attendance Improvement Planning (SAIP) meeting upon their child's third unexcused absence,  the parents must once again attend a second SAIP meeting upon their child's reaching a sixth unexcused absence. The parents and the school administration must identify reasons for the absences and formulate a plan to improve attendance.  In the past, these meeting occurred after ten unexcused absences.  Should a student continues to miss school, they must be in a school sponsored truancy elimination plan before legal action may take place.  The new laws require earlier identification and meetings to problem-solve the reasons behind the absences before punitive measures are enforced (PDE, 2015b).

The results of research Questions 1 and 2 indicate the need for further research in the area of individual attendance and academic achievement.  The current study analyzed Keystone Literature Exam scores, but future researchers should replicate questions one and two using Algebra and Biology Keystone Exam scores to determine whether the same patterns exist.   Future studies could also apply similar models to other forms of assessment, such as the state achievement tests at lower grades and WIDA ACCESS scores.  Further analysis could also include measures of prior performance and teacher rating to determine if relationships exist between the variables of individual student attendance and achievement.  There is a need for researchers to delve deeper into the analysis of demographic variables and examine differences between grade level, testing semester, ESL level, age, and gender. Qualitative analysis may also illuminate why there was no significant relationship between the unexcused absences of students with IEPs and their ELA academic achievement.

In summation, the current study reinforced the role of unexcused absences and prior achievement as a significant predictor of student achievement in high school, while also identifying differences in the attendance and achievement relationship among subgroups of students. In addition, the study determined that a punitive attendance policy was not a significant predictor of assessment scores.   Despite the importance of these research findings, the complexity of student attendance and academic achievement leaves a number of existing variables and assessments yet to be explored.  These additional research avenues present us with an opportunity to better understand how to help each and every student succeed academically.

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122

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Vitae

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## Education

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| King's College, Wilkes Barre, PA | 2010 |

Master of Arts in Education, Curriculum and Instruction

Bloomsburg University, Bloomsburg, PA                    2007
Bachelor of Science in Secondary Education and Spanish

Universitas Castellae, Valladolid, Spain                    2005
Spanish Studies

## Certifications

PA- Principal, K-12
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## Work Experience

**World Language Department Chair**, 2016-2019
Hazleton Area School District, Hazleton, PA

**Spanish Teacher,** 2008, 2009-2019
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**Adjunct Faculty**, Graduate School of Education, 2011-2019
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**Virtual Academy Spanish Instructor,** 2009-2012
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**ESL Teacher**, Central Susquehanna Intermediate Unit Migrant Education Summer Camp, 2009-2010
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