The Patterns and Possible Costs of Teacher Absenteeism: Are Teacher Absences an Indicator of Student Achievement?

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ABSTRACT

Since the inception of No Child Left Behind, particularly in the past few years, teacher accountability is at the forefront of educational debate. Taking in to account the many facets of teacher accountability, student performance is nearly half of teacher evaluation systems. Considering the value of a quality teacher, one would logically presume that the teacher was present in the classroom to ensure student achievement. However, teacher absenteeism is an overlooked issue in today's accountability system. The relative dearth of evidence and a practitioner's lens of logical reason prompted an interest to investigate the relationship further. The historical perspective in the literature that does exist related to teacher absenteeism revealed that teacher absences are expensive and negatively affects student achievement.

The purpose of the quantitative study was to determine if patterns exist among teacher absences and to determine the relationship between teacher absences and student achievement performance on state standardized tests in English, math, science, and social studies. A quantitative research design was employed using one-way analysis of variance (ANOVA) and sequential multiple regression as the primary analytical procedures. Using data from a single school division in Virginia, analyses were conducted to determine if there were patterns among teachers' absences, if teacher absences predicted student achievement, and if teacher absences influenced certain student groups more than others. Although some evidence in the research literature indicates that student achievement decreased with increased teacher absenteeism, the current investigation did not reveal consequential evidence that teacher absenteeism negatively impacts student achievement. Implications from the findings, along with recommendations for future research, are presented in the final chapter.

Dedication

This work is dedicated on Father's Day to James Arnold Jones, VPI Class of 1970.

The Lord blessed my life for thirty-seven years with your love, example, leadership, teaching, and friendship. You were here when I started this journey and I finished it for you, Dad!

You are greatly missed ... from your loving daughter and fellow Hokie, Dee.

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He has showed you, [Janet], what is good. And what does the LORD require of you? To act justly and to love mercy and to walk humbly with your God (Micah 6:8).

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I could have intentionally selected four people to serve together and then retire at the same time. I wish each of you a wonderful life of time for family, friends, and days of nothing, if you so choose. Your enthusiasm for the next chapter in life is encouraging for those of us who continue to fight the good fight.

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Quod Erat Demonstrandum

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CHAPTER 1 INTRODUCTION

Background

Teacher quality and student achievement. "Nearly all observers of the education process, including scholars, school administrators, policy-makers, and parents, point to teacher quality as the most significant institutional determinant of student achievement" (Clotfelter, Ladd & Vigdor, 2007b, p. 3). Scholars, policy-makers, and administrators agree that teacher quality is the most critical school-based factor affecting student achievement (Donaldson, 2011; Teacher Quality, 2011). At the forefront of this agreement is an ongoing debate, regarding how teacher effectiveness should be measured (Darling-Hammond, 2010; Sawchuk, n.d.).

According to *No Child Left Behind (NCLB)*, teachers are required to be "highly qualified" by possessing a bachelor's degree, acquiring a state teaching license, and demonstrating mastery of the content (Guilfoyle, 2013). Additionally, political pressure has generated an era of teacher effectiveness defined by student achievement as the 2009 Race to the Top federal grant called for states to develop teacher evaluation systems based on student growth measures (Guilfoyle, 2013). Teacher evaluation and the statistical methods used to determine how a teacher impacts student achievement as measured by standardized tests, is a heated debate (Guilfoyle, 2013). Goe (2007) states that using standardized tests to measure teacher effectiveness is challenging: because standardized tests were developed to measure student achievement and not teacher quality therefore, it is difficult to separate teacher effects from classroom effects, and it is difficult to match student data with teacher data in order to relate individual teachers to student achievement scores. Measuring teacher quality remains a challenge as findings for such a broadly defined topic are difficult to interpret and difficult to make meaningful conclusions (Goe & Stickler, 2008b).

Despite the limited empirical evidence correlating teacher credentials and student achievement and despite the political efforts to raise the bar for ensuring quality teachers, there is agreement among researchers and policymakers that quality teaching matters for student achievement (Clotfelter, Ladd & Vigdor, 2007a; Clotfelter et al., 2007b; Goe & Stickler, 2008b). The Bill and Melinda Gates Foundation funded a three-year MET (Measures of Effective Teaching) project in an effort to develop an evaluation system that could be trusted by teachers

and administrators (Ensuring Fair and Reliable Measures of Effective Teaching, 2013, p. 4). The research indicated that it is possible to identify teacher quality using three measures: classroom observations, student surveys, and student achievement gains (Bill and Melinda Gates Foundation, 2013). The MET project's executive summary emphasized that, "feedback and evaluation systems depend on trustworthy information about teaching effectiveness to support improvement in teachers' practice and better outcomes for students" (Ensuring Fair and Reliable Measures of Effective Teaching, 2013). Goe (2013) stated that the MET project and other research move educators and policy makers in the direction of balanced and rigorous measures for teacher quality. Goe's (2007) own research on teacher quality offers a means for understanding a framework and practical understanding of "good" teaching.

Goe's (2007) research synthesis provides a comprehensive review of the literature associating teacher quality and student achievement. The synthesis was intended as a "one-stop shop" for researchers and policymakers interested in the implications associated with teacher quality (Goe, 2007). Goe's choice of literature is comprehensive and organized in a manner that offers educators a practical means for ensuring teacher quality and effectiveness in the classroom. As shown in Table 1, Goe & Stickler (2008b) suggests four lenses for examining teacher quality.

Table 1

Goe and Stickler's (2008b) Four Lenses for Examining Teacher Quality

Category	Definition and example indicators
Teacher qualifications	Credentials, knowledge, and experiences that teachers bring with them when they enter the classroom, such as: coursework, grades, subject-matter education, degrees, test scores, experience, certification(s), and evidence of participation in professional development
Teacher characteristics	Attitudes and attributes that teachers bring with them when they enter the classroom, such as: expectation for students, collegiality or a collaborative nature, race, and gender
Teacher practices	Classroom practices teachers employ-that is, the ways in which teachers interact with students and the teaching strategies they use to accomplish specific teaching tasks, such as: aligning instruction with assessment, communicating clear learning objectives and expectations for student performance, providing intellectual challenge, allowing students to explain what they are learning, using formative assessment to understand what and the degree to which students are actually learning, offering active learning experiences, subscribing to cohesive sets of best teaching practices
Teacher effectiveness	A "value-added" assessment of the degree to which teachers who are already in the classroom contribute to their students' learning, as indicated by higher-than-predicted increases in student achievement scores

Note. From "Teacher Quality and Student Achievement: Making the most of Recent Research," by L. Goe and L. M. Stickler, 2008, *TQ Research & Policy Brief*, p. 2. Copyright 2008 by National Comprehensive Center for Teacher Quality. Reprinted with permission.

The lenses are aligned with the federal expectations of NCLB, emphasizing teacher certification, licensure, experience, and content knowledge. The corresponding research studies were categorized into the four areas and used to "determine whether a preponderance of evidence points to any statistically meaningful measures of teacher quality as well as to determine whether the research as a whole reveals any telling differences between variables" (Goe & Stickler, 2008b, p. 2). The findings for each category are summarized in Table 2 and the related research studies are summarized in Tables A1, A2, A3, and A4 in Appendix A.

Table 2

Goe and Stickler's Research Findings for Examining Teacher Quality

Category	Research findings
Teacher qualifications	Teacher certification matters for mathematics, particularly at the secondary level. Evidence is lacking to support a similar relationship in other areas. There is substantial evidence that teachers' level of experience matters, but only in the first five years of teaching. Content-based pedagogical knowledge is positively associated at all levels of mathematics. Other teacher qualification areas with marginal or mixed results that relate to student achievement are advanced degrees, certification exam scores, choice of undergraduate institution, mentoring programs, and professional development.
Teacher characteristics	Overall, it is unclear that any of the measured characteristics have an impact on student achievement. Teacher collegiality and collaboration are positively related with school-level achievement in mathematics and reading, but the data associated with these characteristics cannot be used to determine individual teachers' impact on student achievement. High expectations for students are associated with school-level findings but cannot be used to determine individual teachers' impact on student achievement. Research indicates that having the same-race teacher for Black and White students improves mathematics and reading achievement; however, there are inadequate sample groups for other ethnicities to assume the same finding.
Teacher practices	Most of the research found some positive correlation between teacher practices and student achievement; however, the findings lack statistical and practical significance, have questionable research designs, or results that cannot be generalized. Teacher practices considered were; alignment of instruction and assessments, clear learning objections and performance expectations, intellectual challenge, explaining what is being learned, formative assessment, and active learning.
Teacher effectiveness	Differences in teacher effectiveness exist; however, challenges with measuring teacher effectiveness are of concern. Some issues are: statistical concerns with value-added models, classroom demographics, availability of resources, student effort, and other factors beyond the teachers' control. Overall the research does not indicate that teacher qualifications, characteristics, or practices contribute to differences in teacher effectiveness.

Note. Adapted from Goe (2007), The Link Between Teacher Quality and Student Outcomes: A Research Synthesis and Goe and Stickler (2008b), Teacher Quality and Student Achievement: Making the most of Recent Research.

"With the exception of teachers' experience during the first five years of teaching and teachers' mathematics knowledge, researchers have not yet developed the tools, measures, and data sources that allow them to state, with a strong degree of certainty and consistency, which aspects of teacher quality matter most for student learning" (Goe & Stickler, 2008b, p. 10). Goe and Stickler's (2008b) practical implications are supported in the research synthesis in the following ways:

- 1. Research conducted at the school level does offer transferable results for linking student achievement to teacher quality.
- 2. The number of variables and considering them in the context of everything that occurs in the learning environment make it difficult to determine the effect one teacher has on student achievement.
- 3. Caution should be exercised when considering standardized student achievement scores that are intended to measure student achievement at a specific point in time. Student scores do not provide a basis for solely distinguishing quality teachers, who also may be contributing to a positive school climate and culture because of their teacher characteristics or leadership qualities.

Although the research is not grounded in statistical significance, the lack of statistical significance does not mean that the results do not provide valuable insight for educational leaders and policymakers. Goe & Stickler (2008b) suggests that the context of the results is important for understanding which teacher qualities impact particular grade levels and course content the most. Also, the researcher states that "one size does not fit all" and teacher quality indicators should be evaluated in a practical sense when developing practices and policies that assist in promoting student achievement (Goe & Stickler, 2008, p. 11). Additionally, local and state requirements for qualifying a teacher should not be dismissed as irrelevant. Areas such as teacher preparation programs, certification/licensure, advanced degrees, professional development, and experience may be lacking in isolation for sufficient data to support a teacher's impact on student learning; however, each of these areas merit further research. The research efforts should continue as teacher quality and student achievement remain at the forefront of policy debate. "One important lesson from these efforts is the repeated finding that teachers are the fulcrum determining whether any school initiative tips toward success or failure. Every aspect of school reform depends on highly skilled teachers for its success" (Center for American Progress, 2010).

The four lenses for evaluating teacher quality leave the educational leader with an assumption about the impact that a teacher has on students. In order for teacher qualifications, characteristics, practices, and effectiveness to have an impact, the teacher must be present in the classroom. Goe and Stickler's (2008b) research synthesis showed evidence that a teacher's experience in the first five years makes a difference for student achievement; however, the research does not address the number of times a teacher may be absent in the first five years. Teacher attendance is yet another variable that may confound the research on teacher effectiveness or may offer another area to consider in the quest for understanding what defines a quality teacher.

Logical reasoning leads to the conclusion that a teacher cannot have an impact on student achievement if the teacher is not present. Some areas of the research synthesis presented on teacher quality have lacked sufficient research to support a link between teacher quality and student achievement (Goe & Stickler, 2008b). If teacher attendance were considered as a teacher characteristic, the empirical research would quickly reveal an even smaller body of literature.

Employee absenteeism is not a new phenomenon as the first noted study was conducted by Hill and Trist (1953, 1955) in the 1950s. Since that time, the literature presents a wealth of research regarding employee absenteeism in business and industry (Chadwick-Jones, Nicholson & Brown, 1982; Hill & Trist, 1953, 1955; Johns & Nicholson, 1982; Long, 1987; Martocchio, 1994; Nicholson & Johns, 1985; Steers & Rhodes, 1978). Again, logical reasoning would lead one to assume that the same phenomenon exists in the educational arena; however, the research is somewhat limited regarding teacher absenteeism (Clotfelter, Ladd, & Vigdor, 2009; Ehrenberg, Rees & Ehrenberg, 1991; Miller, Murnane & Willett, 2008; Rosenblatt & Shirom, 2005, 2006; van Dick & Wagner, 2001).

The issue of teacher absenteeism is a growing consideration for policymakers, particularly since the Office of Civil Rights decided to include teacher attendance on the 2009 Civil Rights Data Collection survey (Miller, 2012). Miller (2008) reports on data from a large, urban school district in the northern United States and concludes that the "analyses of the data corroborates previously documented relationships between absence and observed characteristics of teachers, such as gender, experience, tenure, and commuting distance, as well as school characteristics such as enrollment, grade configuration, and average student attendance rate" (p. 1). Certainly this statement captures teacher characteristics already noted in the teacher quality

discussion and adds teacher attendance as another teacher characteristic in need of research.

Federal expectations from *NCLB* require each school system to publish a school report card, noting an array of data associated with student achievement and school accreditation. According to Miller (2008), Rhode Island has included teacher attendance rate on the school report card. Miller suggests that adding a graphical profile of teacher absences to the school report card would permit a glimpse of school culture. Additionally, a profile would assist educational leaders in addressing school improvement needs, accountability expectations, and equity among schools with varying levels of socioeconomic status (Miller, 2008).

Many elements related to teacher quality have been discussed and the issue of teacher attendance should not be avoided in considering indicators that promote student achievement. According to Miller (2008), "teachers' presence in school is a fundamental prerequisite of student success" (p.2). The following research synthesis and study explores this notion further.

Teacher absenteeism and student achievement. "New research suggests that teacher absenteeism is becoming problematic in U.S. public schools, as about one in three teachers miss more than 10 days of school each year" (Toppo, 2013). School systems are not exempt from the current economic frustrations and are being forced to find ways to save jobs and maintain instructional positions with less funding. Expectations for higher standards and continued slashing of educational budgets leaves educators with the enormous task of sustaining highly qualified teachers in the classroom. Such a task often leads to stressful workloads and strain in teaching which results in negative outcomes, such as teacher absenteeism (van Dick & Wagner, 2001).

According to Miller (2008), substitute teachers cost \$4 billion annually, which is approximately one percent of federal, state and local spending on K-12 education. Elizabeth (2001) stated,

Each day, about 5 million children walk into 274,000 classrooms nationwide and find a substitute. Students today will spend at least one full year with a substitute by the time they graduate from high school -- a figure that's higher in poor schools and destined to increase. (p. 1)

While the monetary costs of teacher absenteeism are increasing, finding qualified teacher replacements is an additional dilemma (Norton, 1998). Miller (2008) stated that teacher absence policies should be reviewed for three reasons: "teacher absence is expensive, teacher absence

negatively affects student achievement, and teacher absence disproportionately affects low-income students" (p. 1). Administrators are pressed to find a solution for teacher absenteeism as substitutes are costly; however, the greater loss seems to be with student achievement (Keller, 2008).

Statement of the Problem

Specific research on teacher absenteeism and its effects on student achievement is sparse, partly due to the fact that teacher absenteeism is not reported to state education departments by school districts (Ehrenberg et al., 1991). A review of literature indicates teacher absenteeism in developing countries, such as Zambia, Kenya, and India, is higher than in the United States (Banerjee & Duflo, 2006; Das, Dercon, Habyarimana, & Krishnan, 2007; Duflo & Hanna, 2005). Strategies such as, pay incentive and stricter accountability, have been investigated in developing countries where economic difficulties persist and substitutes are not available (Duflo & Hanna, 2005). Teacher absence rates are high (i.e., 19%) in developing countries when compared to developed countries (Chaudhury, Hammer, Kremer, Muralidharan, & Rogers, 2006). Limited research regarding teacher absenteeism in the United States does not afford comparable data; however, a sample of over 700 school districts in New York State revealed a mean absence rate of 5% in one school year (Ehrenberg et al., 1991). In a 1999-2000 U.S. Department of Education survey, 5.2% of teachers were absent on any given day, which is 9.4 days out of a 180-day school year (Podgursky, 2003). This rate is higher than other professional and private sector employment and the Bureau of Labor and Statistics reports that the absence rate is 1.7% of a professional's annual hours worked (Podgursky, 2003).

Limited research regarding teacher absenteeism prompts additional investigation and debate. Under *NCLB*, administrators and policy makers must press forward to close the achievement gap. Every measure of progress is significant in reaching the perfect status (i.e., 100% of students will pass all standardized tests in English, math, science, social studies) set forth by *NCLB*. The problem of excessive teacher absence is frequently overlooked and the impact on student achievement warrants further investigation. The purpose of the current quantitative study was to determine if patterns exist among teacher absences and to determine the relationship between teacher absences and student achievement performance on state standardized tests in English, math, science, and social studies.

Significance of the Research

Scholarly significance. Teacher absenteeism is higher than absenteeism in the private sector; thus the potential implications for student achievement when a teacher is absent should not be ignored. Two recent studies in the United States suggest that lower student performance results when the regular classroom teacher is absent. Miller, Murnane, and Willett (2008) concluded that teacher absences reduced student achievement, particularly when the absences were unexpected. Clotfelter et al. (2009) concluded that common sense and statistical evidence indicate that students score lower on achievement tests when the regular classroom teacher is absent; therefore, teacher absences are worth worrying about.

An absenteeism study by Steers and Rhodes (1978) established a model suggesting that absenteeism is linked to situation and personal factors that affect an employee's motivation to attend work. The research of Steers and Rhodes, as well as more recent studies (Clotfelter et al., 2009; Miller et al., 2008) of teacher absenteeism, are worthy of further examination.

While the evidence indicates that teacher absenteeism costs school systems additional money and impacts student achievement (Clotfelter et al., 2009; Hill, 1982; Miller et al., 2008), the factors causing absenteeism appear to be varied. For example, Scott and Wimbush (1991), suggested that teacher absenteeism is influenced by job involvement, job satisfaction, gender, and transportation. Clotfelter et al. (2009) and Jacob (2010) put forward the notion that school division policy contributes to teacher absenteeism. In a recent study of teacher dismissal in Chicago, Jacob found that principals are more likely to dismiss teachers who are frequently absent. Jacob suggests that determining teacher productivity, prior to hiring, would be enhanced by data such as teacher absence rates and student achievement. Since Jacob's findings indicated such a drastic administrative measure for frequently absent teachers, more needs to be known regarding the relationship between teacher absenteeism and student achievement.

Practical significance. With limited research comparing teacher absenteeism and student achievement, administrators can only assume that teacher absenteeism negatively impacts student achievement. It seems logical that student motivation and learning is decreased when the regular classroom teacher is absent (Ehrenberg et al., 1991) since it has been demonstrated that teachers are key to increased student achievement (Rivkin, Hanushek, & Kain, 2005; Rockoff, 2004). "It follows that if what teachers do when they are present matters a great deal, the teachers' absence must also affect student learning" (Miller, 2008, p. 3) and probably in a

negative way.

Clotfelter et al. (2009) and Miller et al. (2008) have recently established an empirical basis with findings that support the notion that teacher absences negatively impact student achievement. Miller (2012) has furthered the debate using the Department of Education's Civil Rights Data collection dataset. Beginning in 2009, the Civil Rights Data Collection survey included teacher absences. Miller (2012) states that attention to this issue is important since teachers are critical for student academic success and teacher absences are costly for school divisions. Such findings strengthen the empirical basis and encourage further inquiry surrounding the effect of teacher absenceism on student achievement; as well as considering management tools for minimizing teacher absences and ultimately saving money.

Definitions

Several key terms used throughout the study and are defined here to facilitate the understanding of their usage.

Absenteeism. Goodman, Atkin, and Associates (1984) define absenteeism as a behavior that consists of two parts: location and time. An employed individual is expected to be at a specific location at a specified time. When an individual is absent for any reason, the individual is not at the expected location at the specified time (Goodman et al., 1984) Teacher absenteeism was considered as a behavior in which the regular teacher is away from job responsibilities, regardless of the reason. Absence and absenteeism were used interchangeably, one term having the same meaning as the other term.

Adequate Yearly Progress (AYP). Adequate yearly progress became federal law during the 1994 reauthorization of the Elementary and Secondary Education Act ("Adequate Yearly Progress," 2004). AYP is used to determine if schools are successfully educating students as defined by NCLB of 2001. According to the law, 100% of students must be proficient in English and mathematics by 2014.

Classroom teacher. The National Education Association (NEA) defines a classroom teacher as "a staff member assigned the professional activities of instructing pupils in self-continued class or course, or in class situations" (NEA Rankings & Estimates, 2010). A classroom teacher refers to an employee who is contracted for at least 10 months. Also, a classroom teacher is an individual who requires a substitute replacement, when absent.

Organizational factors. Organizational factors are variables such as student enrollment, poverty level, school level, school ethnicity, and principal support (Miller et al., 2008; Rosenblatt & Shirom, 2006; van Dick & Wagner, 2001).

Personal background factors. Background factors are variables that may affect teacher absenteeism (Rosenblatt & Shirom, 2005). Examples of such factors include gender, age, job satisfaction, motivation, distance commuted, level of education, position, salary, tenure, organizational policies, and workload (Miller et al., 2008; Rosenblatt & Shirom, 2005, 2006; Steers & Rhodes, 1978).

Student achievement. In today's era of accountability, the term "student achievement" is tossed around without careful examination of its true meaning. Student outcomes that are demonstrated over time to be positive and progressive in advancement toward higher learning goals should be the objective of those who educate. Measuring student outcomes presents a challenge when consideration is not given for a method other than a standardized test. Understanding student achievement since the inception of *NCLB* has resulted in an era of accountability focused on the outcome of a student taking a standardized test. Therefore, in order to measure student achievement and investigate the impact of teacher absenteeism, data from state standardized tests are commonly used.

Substitute teacher. In the *Job and Interview Career Guide* (2010) a job description for a basic substitute has been posted and reads "a substitute teacher assumes the responsibilities of a regular teacher when the regular teacher is absent. During that time, the substitute teacher imparts knowledge and provides instruction, just like regular teachers." Since there are varying qualifications among school districts for substitute teachers, one cannot assume that the substitute teacher is qualified to provide quality instruction in the classroom. The substitute teacher was assumed to stand in for the regular classroom teacher when the teacher is absent.

Teacher stress. In layman's terms, stress is defined in the *Merriam-Webster Online Dictionary* (2011) as, "a constraining force or influence: as a physical, chemical, or emotional factor that causes bodily or mental tension and may be a factor in disease causation." Teacher stress is defined by van Dick and Wagner (2001) "as a negative effect with diverse psychological (e.g., job dissatisfaction), physiological (e.g., high blood pressure), and behavioral relationships (e.g., absenteeism) correlates" (p.244).

Types of absences. Although an absence was considered as time away from the job,

regardless of the reason; the type of absence was reported as part of the data collection. Individual public school districts grant similar leave types for teachers and policy typically defines the number of days allowed annually per teacher. Examples of types of absences found in public school systems include: sick leave, professional leave, and personal leave.

CHAPTER 2

REVIEW OF THE RELEVANT LITERATURE

Introduction

The literature review that follows presents a synthesis of the current research literature regarding the relationship between teacher absenteeism and student achievement. A review of the literature indicates a lack of understanding regarding the relationship between teacher absenteeism and student achievement (Miller et al., 2008). Only four studies were identified that reported examining the relationship between teacher absenteeism and student achievement (Clotfelter et al., 2009; Ehrenberg et al., 1991; Miller et al., 2008; Woods & Montagno, 1997) and one of the studies produced no evidence that teacher absenteeism was associated with student achievement (Ehrenberg et al., 1991).

The literature review begins with an examination of teacher absence behavior in terms of teachers' personal background factors, teacher stress, school ethnicity, and governance. The research presented regarding absence behavior provides a foundation for understanding factors that may predict teacher absence (Rosenblatt & Shirom, 2005, 2006; van Dick & Wagner, 2001). A review of two recent studies, one conducted at Duke University and the other at Harvard University, is critiqued and considered for current relevance supporting a relationship between teacher absenteeism and student achievement (Clotfelter et al., 2009; Miller et al., 2008).

Search Process

An article by Keller (2008) prompted an administrative interest regarding the possible negative impacts of teacher absenteeism on student performance. Electronic databases, mainly EBSCOhost and electronic journals, were used to begin the search process. The following terms were used in the search process; *absenteeism, teachers, teacher absenteeism, teacher attendance,* and *student achievement*. Initial searches were conducted with no time frame specified. The search was narrowed to literature from 1999 to the present in order to consider investigations of teacher absenteeism as it relates to student achievement in an era of increased accountability.

The search results for the terms used were sparse. Research regarding a relationship between teacher absenteeism and student achievement produced two studies: one from Duke University (Clotfelter et al., 2009) and another from Harvard University (Miller et al., 2008). The

reference lists for the Duke and Harvard studies were exhausted for research relevant to teacher absenteeism.

More research has focused on the private sector than the public sector; however, public sector absenteeism can be more costly for the employer and for the individuals that are served by public employees (Winkler, 1980). Fewer studies were identified that specifically related to teacher absenteeism. Ehrenberg et al. (1991) stated,

The paucity of research on the causes of teacher absenteeism in undoubtedly due to the fact that data on teacher absenteeism are not regularly reported by school districts to state education departments and data on the leave provisions in collective bargaining agreements that teachers work under in each school district are not regularly tabulated anywhere. (p. 73)

Additionally, the search process led to a number of articles related to teacher absenteeism and policy. In 2010, Jacob released a number of articles about the Chicago public school system and the results from a policy change on teacher dismissal. His research on the impact of this policy change and education led to other sources focusing on teacher absence behavior, student achievement, and district policy studies.

Although the search process resulted in a limited amount of research on the impact of teacher absenteeism and student achievement, a thorough investigation of the available research on this topic was conducted. The literature on the impact of employee absenteeism and productivity in industry substantiates research on teacher absenteeism and student achievement (Miller et al., 2008). The research examined provides a theoretical framework for absenteeism, a rationale for understanding absenteeism predicators, and evidence of a relationship between teacher absenteeism and student achievement.

Historical Perspective

Decades of research have been devoted to absenteeism in organizations, possibly from a heightened sensitivity to problems in the workplace due to increased absences or from an interest to improve efficiency in a more challenging economy (Goodman et al., 1984). "Absenteeism is not unique to one specific industry or one geographic locale. It's a major problem for every public and private sector organization, and costs anywhere from \$20-\$25 billion a year" (Long & Ornsby, 1987, p.94). Researchers have attempted to understand absenteeism by suggesting

theories and models to represent a framework for employee behavior (Chadwick-Jones, Nicholson, & Brown, 1982; Martocchio, 1994; Steers & Rhodes, 1978). Steers and Rhodes (1978) hypothesized that attendance is influenced by attendance motivation and the ability to come to work. Although the model was not validated in the investigation conducted by Steer and Rhodes, further research has resulted in an effort to understand absence culture and provide recommendations for improving employee attendance.

Education cannot afford for teachers to be absent as the current standards impose an enormous amount of pressure for adequate yearly progress (Clotfelter et al., 2009; Miller et al., 2008). Regardless of the expectations for adequate yearly progress under NCLB, every child deserves a quality education delivered by a highly qualified teacher. Teacher absenteeism is reported as being quite high today, particularly compared to other professions (Miller et al., 2008; Podgursky, 2003). The District Management Council (2004) has indicated that nationally teachers are absent from the classroom approximately two weeks during a school year and that larger urban school districts have an even higher rate of teacher absences. Teacher absenteeism is not a new phenomenon; 30 years ago, Hill (1982) stated that 200,000 teachers nationally were absent every day. This absenteeism created an annual loss of 75 million hours of contact time with students and \$2 billion to school districts (Hill). While the literature presents a wealth of research regarding employee absenteeism in business and industry (Chadwick-Jones et al., 1982; Hill & Trist, 1953, 1955; Johns & Nicholson, 1982; Long, 1987; Martocchio, 1994; Nicholson & Johns, 1985; Steers & Rhodes, 1978), the research is limited regarding teacher absenteeism (Clotfelter et al., 2009; Ehrenberg et al., 1991; Miller et al., 2008; Rosenblatt & Shirom, 2005, 2006; van Dick & Wagner, 2001).

Using the premise of employee absenteeism and the problems in the private sector that stem from the negative employee behavior, one might surmise that a similar relationship exists for teachers who miss work. Recently, some research attention has been given to teacher absenteeism and the factors related to the behavior (Rosenblatt & Shirom 2005, 2006; Scott & Wimbush, 1991; van Dick & Wagner, 2001). Policy studies reveal that teacher absenteeism may be encouraged by the structure of the district's leave policy and a lack of knowledge by the boards of education that teacher absenteeism is a problem (Hill 1982; Winkler, 1980). Banerjee and Duflo (2006) and Jacobson (1989) found that incentive pay for teacher attendance resulted in fewer absences. Jacobson's (1990) focus on attendance incentives stimulated a more riveting

issue for future research related to teacher absenteeism. Jacobson (1990) asked, "What is the relationship, if any between teacher absenteeism and student achievement" (p. 90). This is a valid question and Jacobson (1990) states further that, "it seems reasonable that there exists a relationship between continuity of instruction (which would be a function of both teacher and student attendance) and academic performance" (p. 90).

In the past five years, Education Week has published six articles regarding teacher absenteeism (Dakarai, 2010; "Districts Experiment With Cutting Down on Teacher Absence," 2008; "Policies Allow Districts to Cut Corners With Substitutes," 2007; Sawchuk, 2008; "Studies Link Teacher Absences to Lower Student Scores," 2008; "W.Va. District Cuts Incentives for Teachers to Come to Work," 2009). At an average of one article a year, four of the articles suggested that teacher absenteeism has a negative effect on student achievement. A review of literature for empirical research on this topic revealed only four studies which examined the relationship between teacher absenteeism and student achievement. For example, in 1989, a research study was published addressing how teacher and student absenteeism influenced student achievement (Ehrenberg et al., 1989). The investigation revealed that higher student absenteeism is associated with poorer performance in standardized tests; high teacher absenteeism did not appear to be associated with poorer student achievement (Ehrenberg et al., 1989). However, the researchers only analyzed the pass rates on a set of standardized tests and did not consider the type of leave for absent teachers. Interestingly, the study did reveal that lower teacher absenteeism led to lower student absenteeism (Ehrenberg et al., 1989). Thus, while teacher absenteeism may not directly relate to student achievement, it seems logical that one should not conclude that teacher absenteeism has no relationship to student achievement (Ehrenberg et al., 1989).

In a related study, Woods and Montagno (1997) conducted a study of students' performance on the third and fourth grade Iowa Test of Basic Skills. Teacher attendance data were matched to students' grade equivalency change scores in reading between the third and fourth grade (Woods & Montagno). The statistics showed that students grade equivalency increased from the first administration of the test to the second. The statistical differences were significant (p < .01) and revealed that the grade equivalency change was greater for students matched to teachers who had fewer absences. Woods and Montagno concluded that teacher absenteeism has a negative effect on student achievement. The researchers recommended further

investigation matching teachers and students while tracking teacher attendance and student achievement. Also, the researchers recommended that district policy and practices should not encourage teachers to be absent. It was predicted that the result of both recommendations would be a monetary savings for any district and increased student achievement.

Since 1997, two additional research studies have been added to the literature concerning the relationship of teacher absenteeism and student achievement. Researchers at Harvard University (Miller et al., 2008) and Duke University (Clotfelter et al., 2009) have investigated the impact of teacher absence on achievement for mathematics and English standardized test scores in elementary grades. Miller et al. (2008) found that 10 additional days of teacher absence reduced mathematics achievement by 3.2% of a standard deviation and that the same number of teacher absent days that are unexpected reduced mathematics achievement by more than 10% of a standard deviation. The authors suggested that the findings were meaningful enough in the current accountability era to warrant a policy investigation regarding teacher absences.

The research conducted at Duke University revealed similar results (Clotfelter et al., 2009). The researchers found statistical evidence that students performed lower on state tests in elementary grades when teachers were absent. Ten additional days of teacher absence reduced mathematics scores by 2.3% of a standard deviation and about 1% of a standard deviation for reading scores. Additionally, the study revealed that low-income students were served by teachers with a higher rate of absence than teachers who served high-income students. Clotfelter et al. (2009) found that ten days of teacher absence was associated with a drop of 3.3% of a standard deviation for low-achieving students compared 0.3% for above-average students. Like Miller at al. (2008), Clotfelter et al. (2009) recommended a policy investigation, citing that incentive programs should be considered, particularly in the interest of reducing disparity between high and low income schools.

Absenteeism is not a unique quandary for any organization (Long, 1987). Previous absenteeism research in industry and business provides a valid foundation for investigating teacher absenteeism. The continual reduction in funding for public education presents a financial burden for school districts paying additionally for high rates of teacher absence. Moreover, "the lost learning time is never recoverable, and the disruption in curriculum continuity can slow learning when the teacher returns to class" (The District Management Council, 2004, p. 2). Additional research is warranted for the common sense notion that students learn less when the

teacher is absent. The small amount of literature available to substantiate this notion and an interest to deliberate how a student's education is impacted by teacher absenteeism provides a framework for further investigation.

Theoretical Framework

Understanding absence culture may provide a basis for further research to investigate the relationship between teacher absenteeism and student achievement. The notion of absence culture was initially introduced by Hill and Trist (1953, 1955) during a time of high job employment after World War II. Concern in some western countries for high levels of labor turnover and absence was prevalent in industry and Hill and Trist responded to a steel industry's request to reduce labor turnover and absenteeism. The researchers proceeded, with a process approach in their investigation and revealed the employer's "... recognition and toleration of a level of unsanctioned absences" (Hill & Trist, 1955, p.16). Hence, the researchers' development of absence culture was introduced. Hill and Trist (1955) believed that, "understanding, recognition and tolerance of absence phenomena in their different forms are necessary for their effective control" (p. 16). Their study lead to "... a new theoretical framework and new empirical findings on the basis of which conscious design of appropriate absence cultures may be undertaken" (Hill & Trist, 1955, p. 16).

Since the inception of the theoretical basis for absenteeism, scholars have attempted to measure and quantify the behavior in an effort to establish recommendations for understanding absenteeism and methods for improved employee attendance (Chadwick-Jones, Brown, & Nicholson, 1973; Muchinsky, 1977; Steer & Rhodes, 1978). Nicholson and Johns (1982) stated that past research focusing on social and organizational variables of absenteeism were inconsistent and "... failed to generate significant dividends ..." in order to posit a "... prediction, explanation, or control of absence" (p. 128). The researchers set forth six propositions that have been the basis for previous empirical studies and then introduced six counterpropositions that were intended to generate new research methods and truly define absence theory (Nicholson & John, 1982). Thus, Nicholson and Johns (1982) defined absence culture as "the set of shared understanding about absence legitimacy ... and the established 'custom and practice' of employee absence behavior and its control" (p. 136).

Nicholson and Johns (1985) asserted that absence culture operates in three ways. First, an employer's tolerance for absenteeism may have a direct effect on the level of absence. Second, employees' observations of their colleagues' absence behavior may result in a pattern of behavior that reflects the observations. Third, variations in the culture may result in high employee attendance, despite job dissatisfaction, or absence may be the response to dissatisfaction. These factors influence absence culture but do not establish a set theory per se; rather, they reflect the assumption that absenteeism may result as a behavior influenced by "social consensus both inside and outside the workplace" (Nicholson & Johns, 1985, p. 398).

Despite Nicholson and Johns' (1982) rejection of previous research findings regarding absenteeism, the effort of the scholarly predecessors should not be completely ignored. Steers and Rhodes (1978) introduced a process model that accounted for voluntary and involuntary employee absences and was based on 104 empirical studies on absenteeism. The model was intended to demonstrate that absenteeism was related to a host of personal and organizational variables as opposed to the focus in previous literature on job satisfaction. The process model was based on two principles: an employee's motivation to attend and an employee's ability to attend. Attendance motivation was described by the following factors: job satisfaction, economic conditions, incentive programs, work-group norms, personal work ethic, and commitment to organizational goals. The employee's ability to attend was influenced by: illness and accidents, family responsibilities, and transportation problems. The model was presented as a cyclical process, in which, employee absenteeism resulted in changes to the job situation which, in turn, influenced the employee's motivation to attend work. The results from the Steers and Rhodes investigation were not sufficient to validate the model; however, their research is cited often and has influenced subsequent research, even teacher absenteeism (Rosenblatt & Shirom, 2006).

Scott and Wimbush (1991) used the process model introduced by Steers and Rhodes (1978) to examine teacher absenteeism in secondary schools. Scott and Wimbush (1991) believed that the process model gave a "substantial rationalization" (p. 510) for investigating the factors related to teacher absenteeism in secondary schools. They acknowledged the "statistical nonsignificance" in the Steers and Rhodes (1978) study, but stated that it "... cannot be used to prove that a relationship does not exist" (p. 510).

Scott and Wimbush (1991) used the process model and selected variables related to attend motivation or the ability to attend. "It was hypothesized that the variables selected would

be significantly related to, and contribute substantially to, explaining difference in the absenteeism rates ..." (Scott & Wimbush, 1991, p. 511). The findings revealed that only two variables were related to the ability to attend: distance to work and gender. The findings related to teachers' motivation to attend revealed that job satisfaction, job involvement, and involvement in activities outside of work were related to absenteeism (Scott & Wimbush, 1991). Although the study did not completely support Steers and Rhodes' (1978) process model, the researchers believed that results could be used to lower teacher absenteeism.

Understanding the historical development of absence culture in industry followed by decades of research on employee absenteeism, prompts a reasonable inquiry for examining the absence culture surrounding teacher attendance. "A school's culture comprises the norms dealing specifically with absence. It is difficult to study its effects since absence culture is largely an informal, undocumented phenomenon" (Miller, 2008, p. 6). Indeed, a review of the literature regarding teacher attendance reveals that such studies are not as prevalent in the literature as are studies that contribute to an understanding of public and private sector employee attendance. Due to the relatively undocumented phenomenon of teacher absence culture and the supposition that there is a relationship between teacher absenteeism and student achievement exists, more empirical research is necessary.

Current Research

Introduction. As previously discussed, employee absence behavior has been investigated in the public and private sectors for years (Chadwick-Jones et al., 1982; Johns & Nicholson, 1982; Long, 1987; Martocchio, 1994; Nicholson & Johns, 1985; Steers & Rhodes, 1978). Organizations throughout business and industry have recognized the effect of employee absenteeism and implemented strategies to improve the behavior (Hill & Trist, 1953, 1955; Long, 1987; Martocchio, 1994). The concept of absence culture was developed during an industrial period when jobs were abundant (Hill & Trist, 1953, 1955). Scholars have sought to understand absenteeism, examined the effects of employee absence on productivity, and recommended strategies for improving the behavior (Chadwick-Jones et al., 1982; Hill & Trist, 1953, 1955; Johns & Nicholson, 1982; Long, 1987; Martocchio, 1994; Nicholson & Johns, 1985; Steers & Rhodes, 1978).

Few scholars have examined absence culture among classroom teachers. The search process for teacher absenteeism revealed a small archive of literature, particularly literature relevant in the United States. Teacher absenteeism in the United States, as compared to developing countries, has not been recognized as a relevant research topic (Banerjee & Duflo, 2006; Das, Dercon, Habyarimana, & Krishnan, 2007; Duflo & Hanna, 2005). Thus, the search process for research in the United States regarding teacher absenteeism did not provide a wealth of literature for consideration. The literature presented is intended to provide a scope of understanding for the absence culture among teachers. Due to the limited nature of empirical studies, literature has been cited for investigation of teacher absenteeism in countries outside of the United States (Rosenblatt & Shirom, 2005, 2006; van Dick & Wagner, 2001).

Assumption and logic would suggest that absences for classroom teachers would present costly outcomes and concern for learning loss. Examination of educator commentaries revealed a growing concern for teacher absenteeism, particularly in a stressful culture focused on accountability for student achievement (Dakarai, 2010; "Districts Experiment With Cutting Down on Teacher Absence," 2008; Hill, 1982; Miller, 2008; Pohl, 2001; Pitkoff, 1993; "Policies Allow Districts to Cut Corners With Substitutes," 2007; "Reducing Teacher Absenteeism," 2004; Sawchuk, 2008; Smith, 2001; "Studies Link Teacher Absences to Lower Student Scores," 2008; "W.Va. District Cuts Incentives for Teachers to Come to Work," 2009); however, recent and relevant scholarly literature showing a relationship between teacher absenteeism and student achievement was discovered in only two investigations (Clotfelter et al., 2009; Miller et al., 2008).

Predicting teacher absenteeism. Rosenblatt and Shirom (2005) examined teacher absenteeism in the Israeli public school system. By investigating the frequency of teacher absences in relation to personal background factors and job positions, six hypotheses were formulated for the study and are listed below as stated by Rosenblatt and Shirom (2005):

- H1. "Male and female teachers' will not differ in their absence frequency" (p. 211).
- H2. "The number of children in teachers' families is positively related to their absence frequency" (p.212).
- H3. "Teachers' age is negatively related to their absence frequency" (p. 212).
- H4. "The higher the educational attainment, the lower the absence frequency" (p. 212).
- H5. "There is no relationship between seniority and absence frequency" (p. 213).

H6. "Teachers' position level is negatively associated with their absence frequency" (p. 213).

Rosenblatt and Shirom (2005) used data collected from the Israel Ministry of Education personnel files for two school years; 2000-2001 and 2001-2002. The study included (N = 51,916) elementary and middle school teachers. Teachers were excluded who: worked less than 30% or more than 160% of a full–time job, worked less than six months, worked in Jewish settlements in the West Bank and the Gaza Strip, or worked for extremely small schools. All absences were valued the same since the majority of the absentee reasons were due to illness.

Rosenblatt and Shirom (2005) used the 2000-2001 and 2001-2002 absence frequency measures. The prior frequency measure was used as a control variable to show residual change between the two consecutive years. The dependent variable was the change in absenteeism from one year to the next. Values were assigned to gender and whether or not a teacher had an academic degree. Age and tenure were measured in years. School positions were defined as principal, deputy principal, class coordinator, and homeroom teacher. These positions were held by teachers, including the principal, who taught a minimum of six hours per week. Gross monthly salary was used for the month of March 2001. Control variables were marital status, job scope (percentage of full-time job), teaching load (weekly number of hours a teacher was expected to teach), and number of employing schools.

For the analysis, Rosenblatt and Shirom (2005) used hierarchical multiple regression. "The statistical approach taken in this study was to view the two-year teachers' absence behavior as one sample within a string of a 'population' of years" (Rosenblatt & Shirom, 2005, p. 215). A cross-sample was tested by running all analyses on two randomly selected split-half sub-samples.

Rosenblatt and Shirom found that most of the predictors correlated significantly with absenteeism in 2000-2001 (p < .0001) except for marital status. Prior absenteeism from 2000-2001 was a significant predictor of recent absenteeism ($\beta = 0.64$, p < .0001). The control variables were significantly and positively related to absenteeism: job scope ($\beta = 0.02$, p < .0001) and teaching load ($\beta = 0.11$, p < .0001). Five out of the six hypotheses, for the sociodemographic variables, were supported. The number of children in the teachers' family was not found to be related to absenteeism. Rosenblatt and Shirom's analysis resulted in the following conclusions and reported levels of significance for each hypothesis:

H1. Gender had no significant relationship to absenteeism ($\beta = 0.01$, p < .0001).

- H2. Number of children was not related to absenteeism ($\beta = -0.00, p < .0001$).
- H3. Teacher age contributed significantly and negatively to absenteeism ($\beta = -0.08$, p < .0001).
- H4. Higher educational attainment contributed significantly and negatively to absenteeism ($\beta = -0.04$, p < .0001).
- H5. Teaching seniority was not related to absenteeism ($\beta = 0.01$, p < .0001).
- H6. Teachers' position level (principal, deputy principal, class coordinator, homeroom teacher) contributed significantly and negatively to absenteeism (β = -0.10, -0.05, -0.02, -0.02 respectively, p < .0001).

Rosenblatt and Shirom (2005) concluded that absenteeism was higher for teachers "...who worked longer hours, were younger in age, less educated, and less likely to hold a school administrative position in addition to teaching" (p. 218). Support was evident for all of the hypotheses except for the number of children a teacher had in their family. All variables combined to account for 49% of the absenteeism variance.

Several limitations associated with their study were acknowledged by Rosenblatt and Shirom (2005). First, data from the government records were used in the study; however, the original data reported by the individual teacher were not checked for accuracy. It was not possible to check for bias in the data reported by the individual teacher or by the school administration in reporting to central office. Second, only two years of data were used in the study. Rosenblatt and Shirom recommended further research using a longitudinal model that would account for changes in teacher's personal background factors. Third, although the sample was massive (N=51,916), the study was conducted over two years and 49% of the variance was explained. The researchers suggested that other factors may affect absenteeism such as leadership style, hierarchy level (an aspect of the statistical analysis procedure used), size, education level, and policy. The researchers believed that these factors should be investigated for further analysis of the hypotheses regarding the relationship between absenteeism personal and organizational factors.

The results of the Rosenblatt and Shirom study (2005) indicated that teacher absenteeism can be predicted based on personal background factors. The researchers concluded that their findings could be used in three ways. First, a profile of teachers who are frequently absence can be based on statistical support indicating that teachers who are younger, have a lower education,

and do not hold a supervisory position are more likely to be absent. Second, understanding the profile of a teacher who is frequently absent provides a basis for structuring the organization in a way that promotes attendance and provides intervention for teachers who are likely to be absent. The results indicated that teachers who held school administrative positions were absent less. Exposing more teachers to school positions with professional development and additional responsibilities "would allow teachers to exercise various skills, feel in control, and be motivated by better job design" (Rosenblatt & Shirom, 2005, p. 221). Thirdly, the findings should be used to further the research related to teacher absenteeism. Additional factors should be considered such as job satisfaction, job involvement, and stress. The latter is discussed in the following review of German school teachers and stress in teaching by van Dick and Wagner (2001).

Stress and strain in teaching. van Dick and Wagner (2001) investigated stress and strain in teaching and the consequences of teacher stress. They conducted a two part study of teachers in German schools based on a theoretical model of stress (Lazarus & Launier, 1978) that was adapted by Kyriacou and Sutcliffe (1978) to predict teachers' reactions to stress. The following is van Dick and Wagner's (2001) description of the model:

According to the model, potential stressors are seen as antecedents of teacher stress. The effects of these stressors are mediated by coping mechanisms. Kyriacou and Sutcliffe (1978) make an explicit distinction between stressors which are mainly physical (e.g., many pupils in the classes) and those which are essentially psychological (e.g., poor relationships with colleagues). Coping attempts can help to deal with stressful situations, that is, to reduce the perceived threat of those situations. If coping mechanisms are inappropriate, stress occurs. Teacher stress is seen mainly as a negative affect with diverse psychological (e.g., job dissatisfaction), physiological (e.g., high blood pressure), and behavioral (e.g., absenteeism) correlates. In the long run these negative stress effects lead to physiological and biochemical changes accompanied by psychosomatic and even chronic symptoms like coronary heart diseases. Finally, characteristics of the individual teacher are assumed to influence the process. Beneath the core biographical characteristics there are quite a few factors, as for example self-efficacy beliefs or the perception of social support (p.244).

van Dick and Wagner suggested that teacher absenteeism is a result of teacher stress. They proposed a test of the Kyriacou and Sutcliffe stress model on a large sample using complex

structural equation modeling. A second study was conducted by van Dick and Wagner to cross-validate the results obtained in their first study.

van Dick and Wagner (2001) used the results from a questionnaire administered to German school teachers. The sample represented age and gender across all levels of schools, including specialty schools. For the first study, the heterogeneous group consisted of 208 female and 148 male participants. van Dick and Wagner reported that the mean age was 46 years with a standard deviation of eight years and the mean professional experience was 19 years with a standard deviation of nine years. Thirty-four percent of the questionnaires distributed were returned.

In the first part of the study, the questionnaire administered by van Dick and Wagner (2001) consisted of items to be answered on a six-point scale. The dependent variable, physical symptoms, was measured on an eight-item scale. Physical symptoms included symptoms such as headaches and stomach aches. There were 13 workload items referring to problems related to teaching such as student misbehavior. There were four items regarding mobbing or terrorizing in the work place. There were 20 items regarding social support in the workplace. Lastly, there were 14 items regarding self-efficacy.

In the first part of the study, van Dick and Wagner (2001) considered workload and mobbing as stressors and independent variables. The dependent variables were physical symptoms or reactions to stress. The two other variables, social support and self-efficacy, served as control variables. The items were analyzed using exploratory factor analyses and consistency analyses. "Structural equation models were calculated to examine the relationships between the variables" (van Dick & Wagner, 2001, p 247).

In the second part of the study, van Dick and Wagner (2001) included burnout as a dependent variable and coping strategies, which included absenteeism, were added to the predictors. van Dick and Wagner defined burnout as a negative affect resulting in depersonalization of students, unsuccessful feelings, and emotional exhaustion. Additionally, the researchers define coping as "every non-automated teacher behavior directed at stressful events in the school" (p. 253). van Dick and Wagner acknowledge absenteeism as a problem and consider the behavior as a concept of coping.

The sample for the second study conducted by van Dick and Wagner (2001) consisted of 110 female and 91 male teachers. Also, these teachers were surveyed in all levels of German

schools and in seven federal states. The mean age was 45 years with a standard deviation of seven years. The mean professional experience was 17 years with a standard deviation of eight years. Other demographic factors noted were: part-time occupations, married or living with a partner, and having at least one child. Sixty percent of the teachers surveyed responded.

van Dick and Wagner employed the instrument used in the first study but with several additions. Burnout and absenteeism were dependent variables and coping strategies were included. Seven items were added to the mobbing category. A category was added for coping strategies and included 33 items. Burnout was added as a category with 22 items. A final question was added to account for absenteeism; the teachers were asked to record the number of days they were absent due to illness in the last term.

The results of the analysis for part one of the study revealed that the variables were unidimensional and were measured successfully with good internal consistency as indicated by Cronbach's alpha: physical symptoms ($\alpha = .81$), workload ($\alpha = .76$), mobbing ($\alpha = .63$), social support ($\alpha = .86$), and self-efficacy, both internal and external beliefs ($\alpha = .74$ and $\alpha = .65$ respectfully). Structural equation models were calculated to examine how the variables related to each other. van Dick and Wagner found the following:

The model proposed that stressors [workload and mobbing] lead to strain [physical symptoms and burnout] in the long run. Moreover, the general stress model suggested positive influences of personality and environment factors in form of resources to cope with stressful situations. (p. 255).

Particularly, principal support was indicated to be an important variable for reducing teacher stress at work.

van Dick and Wagner (2001) found the results of the second part of the study indicated that the Cronbach's alphas were consistent with the first study findings regarding physical symptoms (α = .81), workload (α = .79), self-efficacy (α = .72), and principal support (α = .79). The mobbing scale was increased by seven items and showed better consistency (α = .82) than in the first study. Coping strategies (α = .75) and burnout (α = .85) both showed sufficient consistency. The objective of the second part of the study was to provide a cross-validation of the results from the first part. The results indicated that the relationships were the same between variables in both studies and that the measures of internal consistency (i.e., Cronbach's alphas) were comparable in both instances.

The model in the second part of the study was broader and included additional concepts: namely, coping strategies and burnout (van Dick & Wagner, 2001). "It was found that coping strategies served as a mediator between workload and burnout; teachers with more adaptive coping strategies showed a lower degree of burnout than teachers with coping strategies based on ignoring problematic situations" (van Dick & Wagner, 2001, p. 255). In addition, they found that burnout served as a mediator between stressors (i.e., workload and mobbing) and physical symptoms. Additionally, they found evidence that increased teacher stress resulted in increased physical symptoms such as fewer personal achievements, emotional exhaustion, and absenteeism in school.

In considering both parts of the study, van Dick and Wagner (2001) found support for the general stress model. Teachers who experienced stress (i.e., workload and mobbing) experienced strain (i.e., physical symptoms and burnout). They concluded that stress can be alleviated by "beliefs about self-efficacy, perceptions of support, and use of appropriate coping strategies" (van Dick & Wagner, 2001, p 256). Two limitations were identified in the conclusion.

The first limitation was that the study employed a cross-sectional design. A longitudinal study would be necessary for establishing causality (van Dick & Wagner, 2001). The researchers stated that longitudinal studies are difficult to conduct, partly due to the unlikelihood of maintaining anonymity over long periods of time. The researchers contended that the cross-sectional surveys are a beginning to proof of causality, particularly when structural equation modeling is incorporated with cross-validation of the analyses (van Dick & Wagner, 2001).

The second limitation van Dick and Wagner (2001) noted was created by the use of self-reported data. Teachers' ideas and perceptions may not be accurately stated if they feel compelled to give consistent answers. The teachers' opinions may reflect their own theories of causality. The researchers stated that some validity was assumed in using self-reported data since the teachers' perception of stress and strain is closer to actual reality. Ultimately, van Dick and Wagner suggest that other data collection means should be incorporated in future studies.

Considering the teaching responsibilities of principals and limited administrative training in Germany, van Dick and Wagner (2001) concluded that the reality of reducing stress and strain is doubtful; however, four practical implications of their research were given. First, teachers can be trained to negotiate teaching stress through programs that enhance self-efficacy. Second, teachers can be trained to utilize appropriate coping strategies. Third, mobbing should be

reduced and opportunities for collegial support should be enhanced to improve employee interactions. Lastly, principal support is invaluable in meeting teacher's needs and minimizing work stress. These implications, practical in nature, may be beneficial in Germany or other countries and school districts seeking to improve teacher absenteeism, particularly the last implication for principal support. A strong relationship between principal support and teacher stress was documented by van Dick and Wagner. The following review of Rosenblatt and Shirom's (2006) work provides additional investigation of the effect of school administrative positions on teacher absenteeism.

School ethnicity, site-based management, and absenteeism. Rosenblatt and Shirom (2005) conducted a study in the Israeli public school system that was described in a preceding section. The study validated that prior absenteeism, age, education, and level of supervisory position were predictors of current teacher absenteeism. Based on their findings, Rosenblatt and Shirom concluded that certain background factors could be used to predict absenteeism and to contribute to a theoretical framework for understanding absence culture.

Rosenblatt and Shirom (2006) undertook another study to investigate the effects of school ethnicity and site-base management positions on educators' absenteeism, considering both teachers and administrators. "The study set out to investigate two things: the contribution of school administrative position on teachers' absenteeism and the effect of key school characteristics on absenteeism of school educators – namely, teachers and administrators" (Rosenblatt & Shirom, 2006, p. 363). As noted previously (Rosenblatt & Shirom, 2005), the Israeli public school system was chosen for examination due to the high rate of absenteeism. The structure of the schools' site-based management consisted of administrators who also taught and teachers who did not hold administrative responsibilities. Therefore, absenteeism was considered for administrators and teachers with regard to whether or not the position had anything to do with frequency of absences. Likewise, the effect of school ethnicity (i.e., affiliation with the Arab or Jewish sector) on absenteeism of teachers and administrators was examined. The following hypotheses were investigated by Rosenblatt and Shirom (2006):

- H1. "School administrative position is related to absenteeism: The higher the position held by a teacher, the lower the absenteeism" (p. 366).
- H2a. "Teachers at SBM [site-based managed] schools will be less absent than teachers at non-SBM schools" (p. 368).

- H2b. "The negative association expected between administrative position and teacher absenteeism (Hypothesis 1) will be greater in SBM schools than in non-SBM schools" (p. 368).
- H3a. "Teachers in the Arab sector will be more absent from work than will teachers in the Jewish sector" (p. 370).
- H3b. "Ethnic sector (Jewish vs. Arab) will affect administrators' absenteeism in the following way: As administrative position becomes higher, the rate of decrease in absenteeism will be higher in the Arab sector than in the Jewish sector" (p.370).

The hypotheses were investigated using absentee data provided by the Israel Ministry of Education for the 2001-2002 school year. All public teachers in 2,145 elementary and middle schools were included (N = 52,056). The following teachers were excluded from the study: teachers who worked in schools in the West Bank and the Gaza Strip, teachers who taught less than 30%, teachers who taught more than 160% of a full-time job, teachers who worked less than six months, teachers who worked in schools with five or fewer teachers, and teachers whose absences were related to long periods of leave were excluded. Reasons for absenteeism mostly related to illness and all absentee reasons were treated equally.

Rosenblatt and Shirom (2006) defined absence frequency as incidents, not periods of time and a total of 276,164 incidents were examined in the study. Nominal values were assigned to the following independent variables: administrative position, site-based management program, and ethnic sector. The control variables were workload (i.e., yearly working hours), school size (i.e., number of students in the school), and school level (i.e., elementary and middle). The dependent variable was absenteeism.

The research design was a nested design of teachers within schools (Rosenblatt & Shirom, 2006). The researchers found that the observations in the data could not be considered as independent and employed the generalized hierarchical linear model as the appropriate procedure. Based on the hypotheses, Rosenblatt and Shirom expected that the administrative level would be negatively related to absenteeism and affected by site-based management and school ethnicity. Also, the school size, school level, and workload control variables were expected to affect absenteeism.

Rosenblatt and Shirom (2006) found that the descriptive statistics showed the average rate of teacher absenteeism was 5.30 (SD = 4.42) incidents. Administrators were absent at rate of

4.93~(SD=4.26) incidents and teachers with no administrative responsibilities were absent at a rate of 5.47~(SD=4.47) incidents. Rates of teacher absence at site-based managed schools and non-site-based managed schools were 5.17~(SD=4.26) and 5.33~(SD) not reported) incidents respectively. Administrators' absence rates at site-based managed schools and teachers' (no administrative responsibilities) absence rates at the same schools were 4.90~(SD=4.07) and 5.31~(SD=4.34) incidents respectively. And, at non-site-based managed schools the absence rates were 4.93~(SD=4.31) and 5.50~(SD=4.49) incidents respectively. The last absenteeism comparison was between administrators and teachers in Arab and Jewish schools. Teachers in Arab schools were absent at a rate of 7.88~(SD=5.64) incidents and teachers in Jewish schools were absent at a rate of 4.48~(SD=3.56) incidents. The rate of absence for administrators compared to teachers in Arab schools was 6.94~(SD=5.49) and 8.29~(SD=5.66) incidents respectively. The rate of absence for administrators to teachers in Jewish schools was 4.29~(SD=3.56) and 4.56~(SD=3.56) incidents respectively.

The results of the hierarchical analysis provided support for all of the hypotheses except those regarding site-based management programs (Rosenblatt & Shirom, 2006). The strongest pairwise correlation was between absence frequency and the Jewish schools, r = -0.59, p < .0001, indicating that teacher absence is less with Jewish teachers than Arab teachers. The findings supported the first hypothesis that the higher the administrative position, the lower the absence frequency, $\gamma = -0.285816$, p < .000. Although weakly, workload was significantly related to absenteeism such that teachers were absent more when the workload was higher. Administrative positions in Jewish schools slightly increased the effect of workload on absenteeism, $\gamma = 0.000132$, p = .002.

Hypotheses 2a and 2b were not supported by the findings (Rosenblatt & Shirom, 2006). Site-based management programs were not found to be significantly related to teacher or administrator absenteeism, $\gamma = 0.007945$, p = .698, and $\gamma = 0.002276$, p = .882, respectively.

Rosenblatt and Shirom (2006) found support for hypotheses 3a and 3b. The first part of the third hypothesis proposed that teachers in Arab schools would be absent more than teachers in a Jewish school. The hypothesis comparing teachers attendance between two ethic sectors was supported, $\gamma = -0.531412$, p = .000. This effect decreased for teachers who held administrative positions. The second part of the third hypothesis stated that administrators who worked in Arab

schools would have a significantly higher rate of decrease in absenteeism than administrators in Jewish schools, $\gamma = 0.050698$, p = .000.

Additionally, the researchers reported findings of two controlled organizational-level factors (Rosenblatt & Shirom, 2006). The factors of school size and school-level (elementary vs. middle) were found to effect teacher absenteeism. The statistics revealed that school size was significant, $\gamma = 0.000384$, p < .001, indicating that "... the teacher in a school with 100 more students will on average be $1.039 = \exp(0.038)$ times more absent" (Rosenblatt & Shirom, 2006, p. 377). Also, school-level was significant, $\gamma = -0.279055$, p < .001, where the variable represented middle school level. Rosenblatt and Shirom (2006) stated that "teachers in middle schools will be absent about 75% of the frequency expected of elementary-school teachers ..." (p. 377).

Rosenblatt and Shirom's (2006) analysis resulted in the following conclusions and reported levels of significance for each hypothesis:

- H1. Teachers with administrative responsibilities have fewer absences, $\gamma = -0.285816$, p = .001.
- H2a. Affiliation with site-based managed schools has no effect on teachers' absenteeism, $\gamma = 0.007945$, p = .698.
- H2b. Affiliation with site-based managed schools has no effect on administrators' absenteeism, $\gamma = 0.002276$, p = .882.
- H3a. Teachers in the Arab schools are absent more than teachers in Jewish schools, $\gamma = -0.531412$, p < .001).
- H3b. For administrators, the rate of decrease in absenteeism is higher in the Arab schools than in Jewish schools, $\gamma = 0.050698$, p < .001.

Overall, the findings of the study indicated that absence frequency is less for teachers who have administrative responsibilities. The researchers also related site-based managed schools and ethic sector to the absence behavior of administrators and teachers and found that site-based management did not prove to be related to administrators' or teachers' absenteeism but that ethnic sector did. Teachers in Jewish schools were found to have an absenteeism frequency of 60% of the absence frequency of a teacher in an Arab school. For administrators, the ethnic effect was larger in Arab schools, where the absenteeism frequency in a Jewish school is 68% of the absenteeism frequency in an Arab school.

Rosenblatt and Shirom (2006) concluded that teacher position and the implications for decreasing absenteeism could assist school officials in planning. They suggested that administrative duties be assigned to a wide range of teachers since teachers who have administrative responsibilities are less likely to be absent than teachers who do not have administrative responsibilities. Rosenblatt and Shirom also suggest that rotating the duties among the teachers may accomplish a lower absentee rate for the school as well.

Rosenblatt and Shirom (2006) recommended that the difference in administrator absences in Arab versus Jewish schools be investigated further in order to understand the motivation behind a larger decrease in the rate of administrator absence in Arab schools as compared to Jewish schools. The researchers hypothesized that political reasons led Arab administrators to follow school policies more than administrators of Jewish schools. Also, they recommended further study of psychological processes, social norms, and cultural factors related to job values and leadership. Rosenblatt and Shirom suggested that data relating such variables to absenteeism may need to be investigated through "softer" methods such as interviews and surveys. The researchers indicated that understanding the influence of school position, school ethnicity, and site-based management on absenteeism may result in better understanding of the relationship between school culture and teacher behavior (Rosenblatt & Shirom, 2006).

The reviews of Rosenblatt and Shirom (2005, 2006) and van Dick and Wagner (2001) identified variables that impact teacher attendance and provided reasons for why some teachers are more absent than others. Personal background factors, stress, and organizational factors have been examined for current relevance and significance in predicting teacher absenteeism. Two groups of researchers who have contributed to the understanding of the relationship between teacher absenteeism and student achievement are Miller et al. (2008) and Clotfelter et al. (2009).

Harvard study – teacher absenteeism and student achievement. Miller, Murnane, and Willett (2008) conducted a study in one urban school district in the northern United States to examine the impact of teacher absences on student achievement. They explored "a hypothesis that to date has received little attention: namely, that part of the class-to-class variation in student learning stems from differences in teacher absence. The hypothesis has face validity in that teachers cannot instruct if they are not in school" (Miller et al., 2008, p. 181). Miller et al. investigated the relationship in a school district where the poverty level and lack of resources at home were a challenge for ensuring quality instruction at school.

Demographic information was provided by human resources for 285 fourth grade teachers and included teachers' home zip code, distance from home to school, absences, experience, licensure, and employment status over three academic years (2003-2005). Additionally, school information was gathered for 75 elementary schools over the same academic years and included student enrollment, discipline, attendance and individual demographics for each school. Four principals were interviewed for their opinions on teacher absences and substitute teachers. Also, three central office personnel were interviewed to determine if the issues that surfaced in the principal interviews accurately portrayed the district's elementary schools.

Miller et al. (2008) reported descriptive statistics that revealed characteristics about teachers and schools included in the study. Of the 285 elementary teachers, 125 teachers had at least two years of experience within the three year period of the study. The average teacher experience was 14 years (M = 13.79, SD = 12.10) and 14% of the teachers were male (M = 0.14). Teacher ethnicity was reported as follows: Asian (M = 0.02), Hispanic (M = 0.05), African American (M = 0.32), and White (M = 0.61). Additionally, the average distance traveled by teachers from home to school was reported as 7 miles (M = 7.14). On average, teachers were absent 10 days during the school year (M = 10.02, SD = 10.77)

Miller et al. (2008) also reported descriptive statistics that revealed characteristics about schools and students included in the study. Of the 75 elementary schools included, nine of the schools were kindergarten through eighth grade elementary schools (M = 0.12) and the other schools were kindergarten through fifth grade elementary schools. Student enrollment for schools included in the study, ranged from 113 to 948 students with an average of 364 students per school (M = 363.96, SD = 191.95). The average days attended by students was 95% (M = 94.64, SD = 1.19) and 4% (M = 4.13, SD = 4.03) of the students received one or more days of suspension. Five percent of the students were reported as repeating the grade where they were enrolled (M = 5.07, SD = 2.49). Eighty percent of the students were eligible for free or reduced lunch programs (M = 79.89, SD = 10.82). Student ethnicity was reported as: Asian (M = 6.74), White (M = 15.01), Hispanic (M = 30.13), African American (M = 47.63), and Native American (M = 0.50).

Miller et al. (2008) used teacher attendance data, the reasons that teachers were absent, and the particular day of the week that teachers were absent to assist in tailoring the investigation

of the impact of teacher absence on student achievement. Descriptive statistics were provided and showed that, on average, teachers were absent 10 instructional days before the fourth-grade mathematics achievement test was given in the spring (M = 10.02, SD = 10.77). Twelve categories of absence were considered based on the absence reason that was provided on each teacher's report of absence. The categories included (in descending frequency of occurrence) days missed for short-term personal illness (one or two consecutive days), medium and long term personal illness, personal necessity, professional conference, other (as allowed by the Family Medical Leave Act of 1993), death in the family, union business, critical family illness, no pay, court appearance, cancer screen, and religious observance. Thus, a total of 1,195 days were missed by teachers with short-term personal illness while days missed by teachers for reasons of religious observance were nine. The number of days missed for all categories combined, over a three- year period, was 3,380. Also, the proportion of instructional days missed adjacent to noninstructional days was reported. Miller et al. (2008) stated that "the percentage of absences attributed to personal necessity that occurred on a day adjacent to a noninstructional day (59.8%) was considerably higher than the 45.7% of instructional days adjacent to noninstructional days" (p. 186). In interviews, the principals consistently reported that teachers believed that they were entitled to discretionary use of their personal days.

Additionally, Miller et al. (2008) investigated the number of days that teachers missed on any given day of the school week and found that 5.14% missed on Mondays, 4.56% on Tuesdays, 4.57% on Wednesdays, 4.39% on Thursdays, and 6.00% on Fridays. The pattern of absences indicates that teachers are absent more frequently adjacent to a weekend. The researchers also found through central office personnel interviews that principals were occasionally given reports indicating which teachers had a concentration of absences adjacent to weekends. Miller et al. (2008) concluded that teacher attendance patterns should be examined in light of district policy.

With regard to student achievement, data were collected by Miller et al. (2008) from a sample of 8,631 students who were in the fourth grade for one or more years during the three-year period of the study. Student demographic variables were employed as covariates in analyses conducted and included ethnicity (85% of the students were non-White), gender (51% were female), English as a first language (66%), special education (13%), and eligibility for free or reduced lunch (83%). The main dependent variable was the mathematics score from fourth grade

state standardized assessments. Other scores were considered and included fourth grade English state standardized assessments and Stanford 9 mathematics and reading scores taken in the third grade. Miller et al. accounted for students who were repeating the third or fourth grade in the current year and at which point students entered the third or fourth grade if they reported after the school year started.

Miller et al. (2008) recognized a limitation by not accounting for student attendance. Ehrenberg et al. (1991) found evidence that teacher attendance was related to student attendance. Although Ehrenberg did not find a relationship between teacher attendance and student achievement, the relationship of attendance data for teachers and students may conceal the notion (Miller et al., 2008). Examining student attendance data may "offer insight about the mechanisms through which teacher absences may affect student achievement" (Miller et al., 2008, p. 190).

The methods for the study included a baseline hypothesized regression model to determine the relationship of teacher absences to students' mathematics achievement (Miller et al., 2008). Data for students and data for teachers were matched in a single year and the researchers "specified that student mathematics achievement depended on teacher absence ..." (Miller et al., 2008, p. 190). An equation was derived to show the mathematics achievement of a student that was taught by a teacher, in a certain school, in a particular year. The number of absences for the teacher served as the predictor of interest. Teacher characteristics and school characteristics were represented by one vector and student characteristics were represented by another vector. Additionally, district patterns in teacher absence and student achievement were taken into account.

Miller et al. (2008) employed two methods to address threats to validity in assessing the impact of teacher absenteeism on student achievement. The first method used ordinary least squares estimations (i.e., regression) to account for bias due to teacher absence resulting from unobserved levels of skill or effort. The second method used an instrumental variables strategy to account for bias due to unobserved time-varying differences in teacher skill or effort. The researchers explained that time-varying differences may occur for a teacher with a very ill family member that requires the teacher to be absent more days than in the previous academic year. It was furthered posited that lower student achievement in the current year (when the teacher had

more absences due to an ill family member) may have been related to low energy levels and high stress levels when the teacher was present.

Two additional instrumental variables strategies were used by Miller et al. (2008) to consider daily weather conditions where teachers lived. The instrumental variables strategies counted by teacher and year the number of days that were "frigid" and the number of days that were "snow-packed." Frigid days were defined as those days where the temperature was below 24 degrees Fahrenheit (M = 39, SD = 16) and snow-packed days referred to days where there was a measurable depth of snow on the ground (M = 38, SD = 16). The researchers accounted for these days in terms of the different geographic areas that teachers' homes represented and the premise that teachers who lived in such areas were more likely to be absent from school on days where the weather presented frigid or snow conditions.

Overall, the findings of Miller et al. (2008) support the hypothesis that teacher absences were related to student achievement. First, the ordinary least squares estimate of the impact of 285 teachers' absences on students' mathematics achievement was negative (β = -0.0037) and significant (p < .05). The model was refitted for 125 teachers, who had more than one year of experience, and was found to be negative (β = -0.0032) and significant (p < .05). The teacher fixed effects estimate was nearly the same as the sample of teachers with more than one year of experience (β = -0.0032) and was significant (p < .05). "This pattern indicates that in this sample, teachers who have relatively weak unobserved teaching skills are not more likely to be absent than teachers with stronger teaching skills" (Miller et al., 2008, p. 192).

The models were also examined by Miller et al. (2008) in relation to student achievement on the fourth grade state English test. The results for all teachers, teachers with more than one year of experience, and the teacher fixed effect model were all negative, smaller in magnitude, and not as precise as the estimates for student achievement on the state mathematics test. The statistics to support this statement were not provided by Miller et al.; however, the question was broached regarding the reason that teacher absenteeism was more strongly related to student achievement in mathematics than in English. Based on principal interviews, the researchers reported that a new mathematics curriculum was introduced during the first year of the study. The new program required extensive teacher training and the use new teaching methods. Substitutes were not trained to teach the new mathematics curriculum and therefore were not able to provide the same instruction when the mathematics teacher was absent.

The control for teacher fixed effects of time-varying differences was only possible to measure by teachers' years of experience (Miller et al., 2008). Even though the measure was weak, Miller et al. (2008) relied on teacher experience as a substitute for understanding the effects of teacher quality and teacher absenteeism. The examination of teacher experience did not reveal interaction effects between teacher experience and teacher absenteeism. Although, the researchers stated that it would be valuable to examine the effects of teacher absences with varying levels of teacher quality.

With regard to the weather conditions and the impact on teacher absence, Miller et al. (2008) found that teacher absences increased when winter weather conditions were present. The researchers reported estimates were significant for teachers with experience ($\beta = 0.147$, p < .01) and teacher fixed effects ($\beta = 0.159$, p < .05).

"The instrumental variable estimates of the impact of teacher absences on student achievement were substantially larger in magnitude and their ordinary least squares counterparts" (Miller et al., 2008, p. 193). The results for the entire teacher sample (N = 285)revealed that the instrumental variables estimate ($\beta = -0.0811$) was about 20 times larger than the ordinary least squares estimate ($\beta = -0.0040$) where p < .01 for both estimates. The findings for the teachers with experience for the instrumental variables ($\beta = -0.0540$) and ordinary least squares ($\beta = -0.0039$) estimates revealed a magnitude that was about 14 times larger, where p <.05 for both estimates. And, the teacher fixed effects estimates for instrumental variables ($\beta = -$ 0.0444) and ordinary least squares ($\beta = -0.0031$) was about the same and the teachers with experience, where p < .05 and p < .01 respectively. Miller et al. (2008) tested and reported that the unplanned absences were influenced by the weather. The researchers' explanation for the larger magnitude, "is that the unplanned teacher absences have a greater impact on student achievement than planned absences do and the instrumental variables estimate is capturing the impact of unplanned absences" (Miller et al., 2008, p.193). Further, they suggest that unplanned absences result in low quality lesson plans left by the teacher and less qualified substitutes due to last minute planning.

Miller et al. (2008) addressed threats to validity by determining if teachers with an extreme number of absences unduly influence the findings. To address this notion four omissions were incorporated. First, teachers who had more than 63 absences were omitted. Second, students who were missing measures in one or more of the prior achievement tests were omitted

(i.e., 19% of the total students in the sample). Third, classrooms corresponding to 3% of teachers who were attributed values of teaching experience were omitted (Miller et al., 2008). And fourthly, student data sets were successively omitted if they entered school after January 15, December 15, November 15, and October 15. Although the results for each of the four omissions were not reported, Miller et al. (2008) stated that each refitting resulted in findings similar to those presented in the study.

The Miller et al. (2008) study provides some evidence that teacher absenteeism is negatively related to student achievement. The researchers employed multiple regression models supplemented with ordinary least squares and instrumental variables estimations to validate the relationship between teacher absenteeism and student achievement. The researchers stated that the findings indicate that ten additional teacher absences are associated with a reduction in student achievement by 3.2% of a standard deviation in fourth grade mathematics. As a result, the researchers recommended that districts employee quality substitutes and improve the quality of lesson plans that are provided to substitutes. Additionally, the researchers suggested that since their data provided evidence that teacher absences affect student achievement, it would be beneficial to review the effects of division policies on the distribution of teacher absences (Miller et al., 2008). Although the study did not investigate how policy impacts teacher attendance, the finding that student achievement appears to be related to teacher attendance prompts further inquiry to better understand teacher absence behavior and its relationship to student achievement.

Duke study – teacher absenteeism and student achievement. Clotfelter et al.'s (2009) research corroborated the findings of Miller et al. (2008) that elementary students' performance on standardized tests is negatively related to teacher absences. Clotfelter et al. (2009) examined teacher attendance in North Carolina for 10 school years (1994-2003) in terms of which teachers were absent most often, the distributional aspects of teacher absence, the relationship to student achievement, and incentives to improve teacher attendance. Other administrative records with teacher data were provided by the North Carolina Education Research Data Center.

Confidentiality was maintained in the use of specific teacher data. An analysis of the leave policy for North Carolina was included to provide an understanding of the type of absence taken by teachers.

Clotfelter et al. (2009) found that the teacher data available to them consisted of the number of days absent by pay period and the reason for the absence. For the purpose of the

investigation, the researchers focused on sick leave, personal leave, vacation leave, and professional leave.

In North Carolina, teachers are granted one sick day per month and the leave can accumulate without limit. When a teacher retires, any unused sick leave is converted to additional service credit and higher pension benefits are available according to the state's benefit structure (Clotfelter et al., 2009). Additionally, a teacher may use up to 20 sick leave days at a rate of \$50 per day, if the teacher has exhausted all accumulated sick leave. Over the 10 years that the study was conducted, the researchers found that sick leave averaged 7.1 days per teacher or 3.9% of the school year.

Clotfelter et al. (2009) found that voluntary absences that were not considered sick leave were labeled as personal leave. Personal leave was accumulated at a rate of 0.2 days per month and required a deduction in pay of either \$50 or a full day's pay. Teachers who had exhausted accumulated sick leave and needed to be absent due to illness were required to use personal leave. For the 10 year period studied by Clotfelter et al. (2009), the rate of personal leave used per teacher averaged 0.9 days or 4.4% of the school year, a finding consistent with previous research, suggesting that teachers are typically absent about 5% of the school year (Podgursky, 2003).

In addition, Clotfelter et al. (2009) found that vacation leave for teachers in North Carolina usually coincides with schools days designated as vacation; thus, students and teachers were not required to report to school. During the first two years of employment, teachers were scheduled 10 days of vacation that coincide with school vacation days. Beginning in the third year of employment, teachers earned vacation leave at a rate that increased with experience. No more than 30 vacation days could be accumulated and days beyond 30 were converted to sick leave. The amount of vacation leave charged to a teacher was never less than 10 days, since those days coincide with mandatory school vacation days. Some districts in the study reported annual vacation leave to average slightly higher than 10 days, while some were slightly lower. Clotfelter et al. stated this may be a result of differing administrative practices among districts. For the purpose of the study, the researchers only considered vacation leave for teachers within the same district. Clotfelter et al. (2009) also found that it was easier for teachers with more experience to be absent, given the number of accumulated sick leave and vacation leave earned.

Additionally, they stated that sick leave and personal leave were typically unplanned and that the impact of this type of leave on the classroom was of greatest concern (Clotfelter et al., 2009).

The other remaining type of leave discussed by Clotfelter et al. (2009) was professional leave. They stated that professional leave was usually administratively mandated for professional development and rarely scheduled at a time that required that a teacher be absent from the classroom. Professional leave had little variation over the 10 year study; however, it did vary across school districts.

Clotfelter et al. (2009) examined the distribution of absence by teachers' years of experience. The researchers posited that teachers with more experience were absent more than teachers with less experience, due to unlimited, accumulated sick leave and vacation leave that was earned with experience. Clotfelter et al. (2009) stated that the examination of actual usage of leave validated that teachers with more experience were absent more often that inexperience teachers. The results for 2000-2001 indicated that teachers with zero to four years of experience averaged 4.8 days of sick leave compared to teachers with five to 10 years of experience who averaged more than eight sick days.

Using ordinary least squares regression with types of absences as the dependent variable, Clotfelter et al. (2009) attempted to identify which teachers were absent most often. For the 10 year study, all classroom teachers with 10 month contracts resulted in a sample of more than 492,000 observations. "Covariates used as explanatory variables include[d] the teacher's gender, race, age, and years of experience, information on the teacher's education and teacher credentials, and information on the teacher's school and district" (Clotfelter et al., 2009, p. 125). The researchers stated that the method of recording vacation leave was not constant across the school districts or across time. Therefore, regressions that included vacation leave were estimated with district-by-year fixed effects (Clotfelter et al., 2009). The researchers stated that regressions for sick leave and personal leave were estimated with and without the district-by-year fixed effects and the estimates were found to be very close (Clotfelter et al., 2009).

With respect to gender and age, Clotfelter et al. (2009) found that female teachers were absent more than male teachers. They stated that, "the estimates imply that female teachers averaged 3.2 days of sick plus personal days of leave than male teachers at ages twenty-five and thirty-five and 1.3 more at age forty-five" (Clotfelter et al., 2009, p. 125). With respect to race, "black and other nonwhite teachers took slightly less sick and personal leave than white

teachers" (Clotfelter et al., 2009, p. 125). With respect to years of experience, teachers in their second year took 1.4 more days than in their first year. Teachers in their third and fourth years took 2.1 days and the results after four years of experience varied. The researchers concluded that the pattern of teachers taking more days with more years of experience was indicative of the limited number of sick and personal days that new teachers were granted.

With respect to teacher's education and credentials, Clotfelter et al. (2009) found that teachers who graduated from colleges outside of North Carolina had more absences than other teachers. They also found that teachers who had higher state examination scores, had a master's degrees, had National Board certification, or had graduated from a very competitive college had fewer absences. Additionally, the researchers' data indicated that teachers had higher absences in schools with higher percentages of free and reduced lunch students, a finding that was investigated further by the researchers.

Clotfelter et al. (2009) examined the distributional aspects of teacher absence by comparing the actual rates of incidence by schools' income level. For 2000-2001, the average number of absences was determined for teachers in schools that were defined by percentage of free lunch students. The averages were shown in four quartiles with the lowest quartile representing the lowest level of income and the fourth quartile representing the highest. The total number of absences and numbers for sick, personal, and vacation leave were considered for elementary, middle, and secondary schools. The average number of sick days was higher for the lowest quartile at each level considered. The difference between the lowest and highest quartile in most categories was about one day or less per teacher. Although, the difference was not large, the researchers posit that, "if teacher absences are harmful to learning, they are apt to be especially damaging if they are schoolwide and occur year after year" (Clotfelter et al., 2009, p. 130).

Clotfelter et al. (2009) further examined the number of schools that experienced high rates of absence consistently and if these schools were low income schools. The 559 schools in the highest quartile of average sick and personal leave for at least five to 10 years of the study were identified and the researchers found that in these schools, the teacher absence was greater in schools classified as low income. Additionally, they found that elementary schools had a higher frequency of absences than middle or high schools. The researchers concluded that, "low-income

students in North Carolina face an appreciably higher chance than affluent ones of attending a school with persistently high rates of teacher absence" (Clotfelter et al., 2009, p. 131).

Clotfelter et al. (2009) suggested that it is common sense that teacher absences will impede student achievement. A standard value-added model was used to determine if the data supported their notion. The model used the number of sick and personal days taken by a student's teacher to compare the average difference in achievement between similar students whose teachers differed by one in the number of sick and personal days. Initial estimates of teacher absences and student achievement were determined by ordinary least squares where fourth and fifth grade students were matched with their teachers for math and English. Academic achievement was compared to the number of teacher sick days while other student and teacher variables were held constant. The estimated coefficient for the teacher absence variable was -0.0023 ($R^2 = 0.0001$), p < .01 in mathematics and in reading was -0.0011 ($R^2 = 0.0001$), p < .01. "This finding implies that having a teacher with 10 additional sick days in a year would be associated with a reduced mathematics test score of about 2.3% of a standard deviation" (Clotfelter et al., 2009, p. 131). In reading, the find implies that the same 10-day increase in sick days would reduce the reading test score about 1% of a standard deviation.

Clotfelter et al. (2009) stated that the results were potentially biased for two reasons. First, teacher absences may have been correlated with unmeasured characteristics of ability or effort that may present bias for omitted variables in the coefficient of absences. Second, teacher absences may have been influenced by a lack of student achievement. To account for such bias, the researchers employed a teacher fixed effects model following the same approach as Miller et al. (2008). The results of the fixed effects of the Clotfelter et al. (2009) study revealed smaller regression coefficients of teacher absences (mathematics estimated coefficient was -0.0017, $R^2 = 0.0001$ and the reading estimated coefficient was -0.0009, $R^2 = 0.0001$) but were still statistically significant (p < 0.01). The findings imply that, "ten additional days of teacher absence would be associated with a decline of 1.7 percent of a standard deviation (s.d.) in mathematics achievement and 0.9 percent standard deviation in reading" (Clotfelter et al., 2009, p. 133).

Clotfelter et al. (2009) addressed two other absence areas with regard to their relationship with student achievement: time of year and the type of substitute used to cover a teacher's absence. These areas were estimated by two variants in order to address the problem of endogeneity (Clotfelter et al., 2009). The first was with regard to the time of year that a teacher is

absent. Evidence suggested that achievement may suffer more when a teacher is absent in the spring rather than the fall. The estimated coefficients of teacher absences differed significantly for mathematics and reading in both approaches of fixed effects and no fixed effects. In the fixed effects model, the coefficients of teacher absences for the number of days absent for the January-June (mathematics estimated coefficient was -0.0023, $R^2 = 0.0001$, p < .01, and the reading estimated coefficient was -0.0012, $R^2 = 0.0001$, p < .01) were about three times larger than the teacher absence coefficients for July-December (mathematics estimated coefficient was -0.0007, $R^2 = 0.0002$, p < .01, and reading estimated coefficient was -0.0004, $R^2 = 0.0002$, p < .05). As the researchers expected, these results indicated a negative relationship between teacher absence and student achievement in elementary mathematics and reading (Clotfelter et al., 2009).

The second area regarding substitute teachers was defined by whether or not a substitute teacher was certified (Clotfelter et al., 2009). The researchers expected that the decline in student achievement would be due to students having a noncertified substitute teacher. The fixed effects models indicated smaller differences between the estimated coefficients for the number of absences covered by a substitute. The estimated coefficient for the number of teacher absences covered by an uncertified substitute in reading was -0.0010, $R^2 = 0.0001$, p < .01 and was -0.0006, $R^2 = 0.0002$, p < .01 for a certified substitute. The differences were not statistically significant in mathematics ($p \ge .01$).

Lastly, Clotfelter et al. (2009) estimated a series of equations to determine if teacher absences were more strongly related to the performance of certain students. The fixed effects models revealed that teacher absences were more strongly related to the performance of students who lived in rural districts for mathematics and reading (mathematics -0.00104, p < .01 and reading -0.00052, p < .01), who were not Black or White (mathematics -0.00065, p < .05), and who were eligible for free lunch programs (mathematics -0.00022, p < .1). Students whose parents did not graduate from high school and students who had a teacher with less than two years of experience did not reveal statistically relationships between teacher absences and student achievement. The researchers noted that the fixed effects model permitted an adequate assessment of concerns related to endogeneity and teacher absences and stated that the method was valid only if, "there are no time-varying determinants of teacher absence that correlate with unobserved determinants of student achievement" (Clotfelter et al., 2009, p. 134). Thus, the achievement level for students in grades four and five was found to fall 0.0017 of a standard

deviation in mathematics and 0.0009 of a standard deviation in reading for every day that the teacher was absent in a given year. Clotfelter et al. (2009) concluded, "that ten additional days of absence would be associated with declines in achievement equal to about one-fifth the advantage of having a teacher with 1-2 years of experience, compared with having a novice teacher" (Clotfelter et al., 2009, p.134).

Clotfelter et al. (2009) concluded that absences are worth worrying about. The study indicated that student achievement generally declined when the teacher was not present. Their evidence suggested that students' performance on mathematics and reading tests in elementary grades declines as the number of teacher absences increases and that teacher absences may have a greater impact on student performance in low-income schools. Clotfelter et al. (2009) further examined the social costs associated with teacher absence and suggested that policy which provides incentives for reducing teacher absences can be advocated; they suggest that incentive programs may allow for an increase in teachers' salaries if absenteeism was reduced and associated cost savings captured. Additionally, it was posited that policies that reduce teacher absenteeism may also reduce disparity between low and high income-level schools (Clotfelter et al., 2009).

Synthesis and conclusions. The literature review presented a general overview of absenteeism, theories regarding absenteeism, and a detailed examination of five studies of teacher absenteeism. The first study reviewed Rosenblatt and Shirom (2005) was conducted to the relationships between teacher absenteeism and personal background factors and job characteristics. The findings indicated that background factors were significant predictors of teacher absenteeism. The second study examined in detail was conducted by van Dick and Wagner (2001). The researchers investigated the stress and strain of German school teachers and concluded that absenteeism could be explained by stress and strain associated with teaching. In the third study presented, Rosenblatt and Shirom (2006) studied the effects of school ethnicity and site-based management on teacher and administrator absenteeism. Rosenblatt and Shirom found that teachers who had administrative roles had fewer absences than teachers who did not and that teachers were absent more frequently in Arab schools than in Jewish schools. The fourth study considered was carried out by Miller et al. (2008) who examined the impact of teacher absenteeism on student achievement in a large urban school district in the northern United States. They found that teacher absences were significantly related to student achievement for state

mathematics standardized tests (i.e., greater teacher absences was associated with lower student performance). The last study analyzed was reported by Clotfelter et al. (2009) who also studied the relationship between teacher absenteeism and student achievement. Based on the data collected and analyzed, Clotfelter et al. (2009) found that mathematics and reading test scores in elementary grades in North Carolina were lower as teacher absenteeism increased. In sum, the finding of the studies suggest personal background factors, job stress, school ethnicity, and governance can contribute to teacher absence and teacher absences appear to be negatively related to some degree of student achievement.

The rate of teacher absenteeism has been reported as being smaller in the United States than in developing countries, but is of growing concern as it is higher than absenteeism in other occupations (Clotfelter et al., 2009). While the studies presented are valuable contributions in this area, research in the area of teacher absenteeism and student achievement in minimal. In fact, the Miller et al. (2008) and Clotfelter et al. (2009) studies appear to be the only investigations from the past ten years focusing on teacher absenteeism and student achievement in the United States – a finding that indicates further investigation is warranted to better understand the relationship between teacher absenteeism and student achievement.

CHAPTER 3 METHODOLOGY

Introduction

As was noted in Chapter 2, a limited amount of research has been reported which examines the relationship between teacher absenteeism and student achievement (Clotfelter et al., 2009; Miller et al., 2008). The relative dearth of evidence and a practitioner's lens of logical reason prompted an interest to investigate the relationship further. The following methodology was planned to address three research questions:

- 1. Are there any notable patterns among teacher absences?
- 2. Do teacher absences predict student achievement?
- 3. Is teacher absence more strongly related to student achievement in particular subgroups of students?

Population

The Commonwealth of Virginia does not collect teacher attendance data from public school divisions. (School districts in Virginia are known as school divisions.) For this reason, teacher absence, student achievement, and other associated data were acquired from a convenience population of middle school teachers and students obtained with permission from a single school division in Virginia. The population examined consisted of approximately 3300 students and 240 teachers from five middle schools. Teacher absences and demographic information were provided by the school division and included years of experience, level of degree, and gender. Additionally, student achievement and demographic data were provided by the school division and included information regarding grade, ethnicity, socioeconomic status, and disability status. All schools in the division had maintained full accreditation status, as deemed by the Virginia Department of Education, over the three-year period (2008-09 to 2010-11) examined.

Prior to undertaking steps in the formal analysis, the raw data were organized into a standard form and prepared for data-mining to examine relationships among the variables in the relational data base that was created (Kantardzic, 2003). The convenience population was representative of all middle school teachers in the single school division who taught a subject

with a Standards of Learning (SOL) test in English, mathematics, science, or social studies. Upon examination of the raw data, some teachers were not included in the analysis because they were not present for the three- year period (2008-09 to 2010-11) that was studied, they had missing data, and/or they taught courses not included in the general middle school program of studies (e.g., Earth Science and World Geography, which are ninth grade subjects in Virginia). As a result, the analyses reported in Chapter 4 are based on a maximum number of 112 teachers.

Of the 112 teachers, the data-mining process revealed two groups of teachers that were considered as part of the entire population, as well as, separate from the population. The first group of teachers was identified based on a high incidence of absences. Of the 112 teachers, eight teachers were confirmed to have taken advantage of the Family Medical Leave Act (FMLA) during the three-year period examined. The eight incidents of high absence were inconsistent with the remaining data and considered as potential outliers (Kantardzic, 2003). Therefore, the analyses reported in Chapter 4 were conducted with teachers on maternity leave (N = 112) and without the teachers on maternity leave (N = 104) to assess what impact these teachers might have on the analysis results and the interpretation of them.

The second group of teachers from among the 112 teachers studied were teachers who taught more than one subject in English, math, science, and/or social studies. Three years of teacher attendance data were sorted and transformed to create a data set of teachers who were present during the three-year period examined (2008-09 to 2010-11) and taught at least one course in English, mathematics, science, or social studies. Teachers who taught multiple subjects from among English, mathematics, science, or social studies were included in the analysis based on data that were provided for at least two years in the same subject. For example, teacher attendance data were repeated for a teacher who taught reading in the sixth grade for two years and reading in the eighth grade for three years. This occurrence is not unusual at the middle school level since teachers commonly teach across grade levels and/or across subject areas. For each of the four content areas examined, statistical differences were examined for teachers across all grade levels, considering that a teacher's attendance rate may have been repeated if they taught more than one subject. Additionally, the analyses reported in Chapter 4 include statistics for teachers without repeated attendance data in any of the four subject areas.

Furthermore, the data set was representative of all middle school students in the single school division who took standardized tests in English, mathematics, science, and social studies.

Middle school students are required to participate in standardized testing in grades six through eight for English, mathematics, and social studies. Middle school students participated in standardized testing for science in grade eight only. Upon examination of the raw data, some teachers were eliminated from the analyses based on certain student conditions: teachers of students who were enrolled in an alternative setting, teachers of students who were homebound, teachers of students who participated in alternative assessments, and teachers of students who took an end of course test, but received instruction for the course in another school division.

Demographic characteristics of teachers studied. As is common in public school divisions across the country (Clotfelter et al., 2009), teachers in Virginia are permitted to take a limited number of days from work without losing pay or benefits. Teachers may be absent without losing pay or benefits for reasons such as jury duty, personal leave, professional leave, and sick leave. Teacher absences that exceed the amount credited by the division are categorized as dock pay and the teacher's daily rate of pay is subtracted for each day missed in this category. Table 3 further explains each category of absence for the school division studied.

The teacher attendance and student achievement data examined were for three consecutive academic years, 2008-09 to 2010-11. Data were analyzed for 112 unique teachers who taught English, mathematics, science, or social studies in one of five middle schools. All teachers represented in the study were employed full-time during the three consecutive academic years examined. The data set provided the number of days absent, by pay period and reason, for each teacher.

A summary of the descriptive statistics for categories of absences and teacher characteristics for the 112 teachers studied are presented in Appendix B and Appendix C. Of these teachers, 77% were female and 35% had a master's degree. On average, teachers possessed 13 years of teaching experience (M = 12.99, SD = 8.13) with the majority of the teachers having between six and 20 years of teaching experience. Fifteen percent of the teachers had less than five years of experience and 17% had more than 20 years of experience. On average, the 112 teachers studied missed 12 days each year. Appendix C summarizes attendance data for each middle school.

Table 3

Categories of Absences and their Associated Definitions for the School Division Studied

Category	Definition of absence				
Dock pay	Employees' daily pay is docked when absences occur and the employee does not have accumulated leave to cover time missed from work.				
Emergency leave	Emergency leave is granted, with written request to the assistant superintendent of personnel, for extenuating circumstances at a maximum of 30 days. Approved emergency leave is deducted from employee's sick leave or leave without pay. Examples of emergency leave may be absences related to flood, fire, involuntary court appearance, or death which extends beyond three consecutive days.				
Jury duty/other	Leave is permitted with no loss of pay if the employee is subpoenaed for job related reasons. Employees subpoenaed for jury duty are given paid leave, minus the amount paid by the court to jurors. Employees subpoenaed to appear in court for reasons unrelated to the profession or for jury duty use acquired leave or take time without pay.				
Personal leave with partial pay	Three days per year can be taken less substitute pay, regardless of whether a substitute is or is not secured, with administrator approval. Personal leave with partial pay days may not be accumulated, transferred, and are not to be deducted from sick leave.				
Personal leave	Two days per year can be taken with full pay at the discretion of the employee with no particular reason, subject to approval by an administrator. Personal leave is not permitted on the day of, day before, or day following a school holiday. Unused personal leave is added to the employee's sick leave balance at the end of the school year.				
Professional leave	Approved leave taken without loss of pay to attend a professional meeting, workshop, or conference.				
Sick family/death	Leave taken without loss of pay to care for an immediate family member. Leave may also be taken for a death in the employee's immediate family.				
Sick leave	Leave taken due to personal illness or accident, without loss of pay unless the employee does not have any sick leave to cover the absence(s). Employees are granted 10 sick leave days per year and unused sick leave may be accumulated.				

Examination of each teacher attendance variable indicated that some teachers were absent more than others. According to the data, females (M = 38.32) were absent more days on the average than males (M = 26.81). Considering each category of absence for the three-year period, the category of dock pay varied markedly for males (M = 2.50, SD = 0.83) and females (M = 10.52, SD = 13.52). Upon examination of the individual teachers, females were found to account for the extreme number of dock pay absences. This occurred for less than 10% of females out of the 112 total teachers and is possibly explained by absences taken as part of the Family Medical Leave Act for reasons such as maternity leave. A complete analysis of teacher background variable differences is presented in Chapter 4. A summary of means and standard deviations for teacher absence data for the 112 teachers examined are presented in Table 4.

Table 4

Means and Standard Deviations for Teacher Absence Data for the 112 Teachers Studied by

Gender, by Degree, and by Years of Experience over Three Academic Years (2009-2012)

Variable	N	TA	DP	EL	JD	PPD	PL	PFL	SFD	S
Teachers	112	35.13	9.95	6.00	2.13	3.13	3.75	4.69	5.54	19.45
		(18.73)	(13.18)	(4.24)	(1.33)	(2.15)	(1.57)	(3.76)	(4.68)	(12.47)
Gender										
Females	81	38.32 (20.14)	10.52 (13.52)	6.00 (4.24)	1.58 (0.92)	3.44 (2.18)	3.90 (4.63)	5.16 (4.13)	5.64 (4.10)	20.73 (13.04)
Males	31	26.81 (10.84)	2.50 (2.12)		3.75 (1.06)	1.82 (1.47)	3.35 (1.31)	3.50 (2.29)	5.24 (6.58)	16.15 (10.34)
Degree										
Bachelor's	75	68.11 (17.49)	19.68 (13.67)	9.00	2.71 (0.92)	5.92 (2.28)	7.11 (1.61)	8.42 (3.42)	11.45 (4.96)	38.09 (11.31)
Master's	37	36.41 (21.24)	9.15 (12.94)	3.00	3.75 (1.06)	3.26 (1.95)	4.04 (1.45)	5.51 (4.3)	4.86 (4.01)	19.74 (14.7)
Years of Exp	perien	ce								
0-5	17	34.91	16.25		3.00	3.28	3.47	4.88	7.88	17.06
c 10	22	(21.46)	(20.07)		1.50	(2.14)	(1.35)	(2.75)	(8.37)	(9.63)
6-10	33	38.41	11.71		1.50	3.44	3.91	4.39	5.48	20.15
11 15	22	(20.02)	(12.49)		(1.32)	(2.64)	(1.42)	(3.43)	(4.47)	(12.19)
11-15	32	30.97	5.70		4.50	3.12	3.72	4.32	4.24	18.81
1 < 20	10	(16.96)	(8.6)	- 00	1.00	(1.96)	(1.67)	(2.72)	(4.76)	(13.44)
16-20	13	32.08	5.50	6.00	1.00	2.50	3.96	4.00	6.83	17.42
		(17.37)		(4.24)		(2.45)	(2.1)	(3.77)	(4.06)	(12.4)
20+	17	39.18	1.63		2.00	2.80	3.63	6.28	6.21	23.21
		17.38	(1.11)			(1.4)	(1.55)	(6.3)	(1.03)	(14.14)

Note. Standard deviations are in parentheses. TA = total absences; DP = dock pay; EL = emergency leave; JD = jury duty/other; PPD = partial pay day; PL = personal leave; PFL = professional leave; SFD = sick family death; S = sick.

Demographic characteristics of students studied. The student population was also examined for the three consecutive academic years, 2008-09 through 2010-11, for which teacher data were obtained. Individual student data were provided and matched to the 112 unique teachers who taught English, mathematics, science, and/or social studies in one of five middle schools in the school division studied. The student information analyzed included data for every student tested in grades six through eight from 2008-09 through 2010-11. Students took three SOL tests (i.e., English, mathematics, and social studies) in the sixth and seventh grades and four SOL tests in the eighth grade (i.e., English, mathematics, science, and social studies). Of the 27,781 student tests administered in the three-year period, 46% of the scores students received were pass advanced, 45% were pass proficient, and 9% were failures. Average scaled scores for individual students and scaled scores for subgroups were included in the analyses. A summary of the student demographics by school is presented in Table 5.

Table 5
Student Demographics by School

School	N	Asian	Black	Hispanic	White	Other	SWD	Disadvantaged
Jefferson	1188	1	3	1	94	1	19	26
Lincoln	2244	7	5	3	84	1	14	15
Madison	2077	5	14	4	76	1	12	26
Roosevelt	2540	1	7	2	88	2	12	25
Washington	1794	5	5	2	87	1	15	16
Total	9843	4	7	3	85	1	14	22

Note. N = total students in each school for 2008-09 to 2010-11. Demographic values represent the percentage of students for each category. SWD = Student with disabilities. Disadvantaged refers to students who receive free lunch.

Data Collection Procedures

Following the acquisition of appropriate permissions, teacher attendance data were provided via Excel spreadsheet by the assistant superintendent of personnel in the school division being studied and included the total number of days absent per month and the reason for each absence. To review, the administrative data covered three academic years (2008-09 to

2010-11) and included middle school teachers of English, mathematics, science, and social studies. Additionally, student achievement data covered the same three academic years (2008-09 to 2010-11) and consisted of scaled scores from the Virginia Standards of Learning (SOL) Assessments in English, mathematics, science, and social studies. Again, after obtaining appropriate permission, the student achievement data were made available by the associate director of testing and remediation in the school division being studied. All data were maintained as confidential information. All data reports were coded such that neither students nor teachers were individually identifiable. Approval to conduct the study was granted by the Virginia Tech Institutional Review Board (see Appendix E).

Data Analysis Procedures

A quantitative research design was employed using one-way analysis of variance (ANOVA) and sequential multiple regression as the primary analytical procedures to mine the data set to examine the nature of the relationship between teacher absenteeism and student achievement in middle grades. ANOVA was employed to determine if significant differences existed among the teacher background variables, such as differences in average years of teaching experiences among the five middle schools of the school division. Subsequently, a series of sequential multiple regression analyses (Keith, 2006; Pedhauzer, 1997) were employed to statistically control for student ethnicity, socioeconomic status, and disability while examining the relationship between teacher absenteeism and student achievement. For each of sequential multiple regression analyses conducted, teacher absenteeism was the primary independent variable of interest with the dependent variable being student achievement as assessed by the Virginia Standards of Learning Assessments in English, mathematics, science, and social studies. Depending on the results of the initial data analyses, additional independent variables (e.g., gender, level of teaching degree, and years of experience) were introduced into the sequential regression analyses as statistical control variables. Sequential multiple regressions were also employed to examine the relationship of teacher absences and student achievement among student subgroups. An alpha level of .05 was used to interpret statistical significance.

CHAPTER 4

DATA ANALYSIS AND RESULTS

Introduction

The previous chapter delineated the statistical methods employed to examine the relationship between teacher absenteeism and student achievement. Three specific research questions were investigated:

- 1. Are there any notable patterns among teacher absences?
- 2. Do teacher absences predict student achievement?
- 3. Is teacher absence more strongly related to student achievement in particular subgroups of students?

Using an alpha level of .05 for all statistical tests, findings from each of the research questions are rendered in this chapter.

Patterns of teacher absence

To address Research Question 1 and understand if there were any notable patterns among teacher absences, ANOVA was employed to compare absences with respect to teacher gender, experience, and level of degree. The comparisons were made using the 112 teachers in the populations who taught English, mathematics, science or social studies in one of five middle schools and then using 104 teachers who remained after excluding eight teachers with a high incidence of absences (e.g., maternity leave). During the three-year period of the study, on average, females (M = 38.32) missed 12 more days than males (M = 26.81), a difference that was significantly different, F(1, 110) = 9.09, p = .003. However, the variance for males and particularly females was large and, therefore, the effect size as assessed by partial eta squared, $\eta_p^2 = .080$, would be considered negligible. Eliminating the teachers who were on maternity, the average days missed for females dropped from 38.32 days to 34.44 days, a difference of about four days over the three-year period studied. However, the difference between males and females was still significant, F(1, 102) = 5.77, p = .020, and the effect size $\eta_p^2 = .050$, would still be considered negligible. The majority of absences for all teachers (e.g., both males and females) over the three-year period were found to be categorized as sick leave (M = 19.45, SD = 12.47)and dock pay (M = 9.95, SD = 18.73). The means and standard deviations for teachers and for

the various absence categories are presented in Table 6.

Table 6

Means and Standard Deviations for Teachers over Three Academic Years (2008-09 to 2010-11)

Variable	M	SD
All teachers ($N = 112$)		
All absences	35.13	18.73
Dock pay	9.95	13.18
Emergency leave	6.00	4.24
Jury duty/other	2.13	1.33
Partial pay day	3.13	2.15
Personal leave	3.75	1.57
Professional leave	4.69	3.76
Sick family/death	5.54	4.68
Sick leave	19.45	12.47
Females $(N = 81)$		
All absences	38.32	20.14
Dock pay	10.52	13.52
Emergency leave	6.00	4.24
Jury duty/other	1.58	0.92
Partial pay day	3.44	2.18
Personal leave	3.90	1.63
Professional leave	5.16	4.13
Sick family/death	5.64	4.10
Sick leave	20.73	13.04
Females excluding maternity leave $(N = 73)$		
All absences	34.44	16.19
Dock pay	3.25	4.58
Emergency leave	6.00	4.24
Jury duty/other	1.58	0.92
Partial pay day	3.28	2.27
Personal leave	3.92	1.66
Professional leave	5.35	4.27
Sick family/death	5.67	4.22
Sick leave	19.28	12.08

(table continued)

Table 6 (continued)

Variable	M	SD
Males $(N = 31)$		
All absences	26.81	10.84
Dock pay	2.50	2.12
Emergency leave		
Jury duty/other	3.75	1.06
Partial pay day	1.82	1.47
Personal leave	3.35	1.31
Professional leave	3.50	2.29
Sick family/death	5.24	6.28
Sick leave	16.15	10.34

Overall, females and males were found to have comparable years of experience with females (M=13.38) averaging one more year of experience than males (M=11.91). The ANOVA analysis conducted revealed no significant differences in years of experience between males and females, F(1, 110) = 0.67, p = .410, $\eta_p^2 = .050$, or between males and females who were not on maternity leave during the three-year period examined, F(1, 102) = 1.35, p = .250, $\eta_p^2 = .010$.

According to Goe (2007), a teacher's level of experience matters with regard to student learning, but only in the first five years of teaching as teachers learn on the job. Clotfelter et al. (2009) found that teachers with five to 10 years of experience averaged over eight sick leave days annually, compared to five sick leave days for novice teachers. For these reasons, teacher experience was also analyzed by categories of five-year increments to determine if there were differences among teacher absences and varying levels of experience. The ANOVA indicated there was no significant absence difference between the various categories of experience, F(4, 76) = 0.40, p = .810, $\eta_p^2 = .020$.

In terms of postsecondary education, all teachers were found to have at least a bachelor's degree and 33% of the teachers had a master's degree. ANOVA showed no significant difference between level of degree in terms of number of absences, F(1, 110) = 0.25, p = .616, $\eta_p^2 = .002$. Additionally, an ANOVA indicated no significant difference in the number of absences between the degree levels when teachers who were on maternity leave were excluded from the analysis,

$$F(1, 102) = 0.30, p = .580, \eta_p^2 = .003.$$

Differences among schools in terms of teacher absences were also examined. ANOVA indicated no significant difference in the number of absences among the five middle schools, F(4, 107) = 1.27, p = .290, $\eta_p^2 = .045$. When teachers who were on maternity leave were not included in the analysis, ANOVA again revealed no significant differences among the five middle schools, even when the teachers who were on maternity leave were excluded, F(4, 99) = 0.45, p = .770, $\eta_p^2 = .020$.

In sum, with the exception of gender, no significant differences in patterns of teacher absences were found using any of the demographic teacher variables, even when consideration was given to potential outliers by eliminating females on maternity leave from the analysis.

Predictors of Student Achievement

To examine Research Question 2 and the notion that teacher absences predict student achievement, sequential multiple regression (Keith, 2005) was used to determine whether the teacher absences were related to student achievement while statistically controlling for the effects of relevant background variables (i.e., teacher gender, experience, and degree). To implement the analysis procedure, student scores on the Virginia Standards of Learning tests (i.e., English, mathematics, science, social studies) were regressed on teacher absences, gender, degree, and experience. The analyses were conducted for all teachers controlling for each variable as well as for all teachers minus those who were on maternity leave. Additionally, since some teachers taught more than one grade level within a subject area, the analyses were conducted for teachers without any repeated attendance data in each subject area (i.e., only one average scaled score per teacher per subject was considered for the analyses). The results of the various analyses that were conducted for each subject area follow.

English. A comparison of the means and standard deviations for every five years of teaching experience showed that teacher absences in English increased by 6% after the first five years and peaked at the highest percentage of days missed for years of experience between six and 10 years (M = 49.66, SD = 22.85). The absences of teachers with experience between 11 and 15 years, decreased considerably by 13% (M = 27.17, SD = 22.85). The absences of teachers with 15 to 20 years of experience increased by 10% (M = 37.42, SD = 9.53) and teachers with 20 plus years of experience showed an increase from the previous grouping by 9% (M = 45.88, SD

= 26.07). Means and standard deviations for teacher attendance and English SOL scaled scores are summarized in Table 7.

Table 7

Means and Standard Deviations for Teacher Attendance and English SOL Scaled Scores over

Three Academic Years (2008-09 to 2010-11) Categorized by Years of Experience

Years of experience	Total absences	Scaled score
0-5	43.68	473.73
	(29.46)	(37.77)
6-10	49.66	495.18
	(22.85)	(23.77)
11-15	27.17	492.67
	(6.27)	(22.66)
15-20	37.42	506.00
	(9.53)	(23.66)
20+	45.88	506.69
	(26.07)	(22.17)
	(==:07)	(=3.17)

Note. Standard deviations are in parentheses.

Total absences were not found to be a significant predictor of student achievement in English while controlling for gender $\Delta R^2 < .001$, F(1, 48) = .010, p = .922, for degree $\Delta R^2 = .001$, F(1, 48) = .029, p = .865, and for experience $\Delta R^2 = .002$, F(1, 48) = .130, p = .720. In addition, neither gender $\Delta R^2 = .002$, F(1, 49) = .094, p = .760, nor level of degree $\Delta R^2 = .002$, F(1, 49) = .102, p = .751 was a significant predictor of student achievement in English; however, teacher experience had a small effect on English SOL scores. For all teachers of English, including maternity and repeated attendance data, experience was a significant predictor of the SOL English scaled scores and accounted for about 12% of the variance of those scores, $\Delta R^2 = .118$, F(1, 49) = 6.534, p = .014. For teachers not claiming maternity leave, experience was also a significant predictor of the SOL English scaled scores and accounted for just over 13% of the score's variance $\Delta R^2 = .132$, F(1, 42) = 6.373, p = .015. For teachers, without repeated attendance data, experience was again a significant predictor of the SOL English scaled scores and accounted for slightly less than 10% of the variance of the scaled scores, $\Delta R^2 = .098$, F(1, 42)

= 4.544, p = .039. For teachers not claiming maternity leave and without repeated attendance data, experience was a significant predictor of SOL English scaled scores and accounted for just under 13% of the scaled score variance ΔR^2 = .127, F(1,36) = 5.242, p = .028.

Mathematics. There were no significant predictors of student achievement in mathematics. The results of the analysis are shown in Table 8.

Table 8

Effects of Gender, Degree, and Experience on Mathematics SOL Scores over Three Academic Years (2009- 2012)

Predictor	ΔR^2	Probability
Gender	.003	.725
Total absences	.047	.134
Gender without maternity	.003	.723
Total absences	.056	.106
Gender without repeats	.000	.977
Total absences	.038	.291
Gender without maternity/repeats	.000	.985
Total absences	.046	.258
Degree	.010	.489
Total absences	.052	.114
Degree without maternity	.010	.495
Total absences	.058	.096
Degree without repeats	.007	.659
Total absences	.036	.307
Degree without maternity/repeats	.006	.669
Total absences	.045	.257
Experience	.000	.991
Total absences	.052	.115
Experience without maternity	.000	.987
Total absences	.063	.085
Experience without repeats	.010	.590
Total absences	.032	.336
Experience without maternity/repeats	.010	.588
Total absences	.037	.309

Science. Science is only tested in the eighth grade in middle school. For this reason, the population of teachers was smaller than for English, mathematics, and social studies. Since the number of teachers was less than $20 \ (N = 13$, the population was too small to analyze with two predictors (Pedhazur, 1997).

Social studies. Total absences were not a significant predictor of student achievement in social studies while controlling for gender $\Delta R^2 = .019$, F(1, 29) = .830, p = .830, for degree, $\Delta R^2 = .005$, F(1, 29) = .154, p = .697, and for experience, $\Delta R^2 = .005$, F(1, 29) = .137, p = .714. Neither level of degree, $\Delta R^2 = .006$, F(1, 30) = .189, p = .667, nor experience $\Delta R^2 = .010$, F(1, 30) = .301, p = .587 were significant predictors of student achievement in social studies. For all social studies teachers, gender was found to be a significant predictor of the SOL Social Studies scaled scores and accounted for almost 33% of the scaled score variance $\Delta R^2 = .326$, F(1, 30) = 14.495, p = .001. On average, female (M = 498.44, SD = 20.18) SOL Social Studies teachers scaled scores were higher than males (M = 466.89, SD = 24.70). It is interesting to note that there were no social studies teachers who took maternity leave during the years examined. For social studies teachers with no repeated attendance data, gender was also found to be significant predictor of the SOL Social Studies scaled scores and accounted for just over 22% of the variance, $\Delta R^2 = .224$, F(1, 24) = 6.908, p = .015. On average, female SOL Social Studies teachers (M = 497.22, SD = 20.58) scaled scores were higher than males (M = 473.29, SD = 25.08).

Teacher Absences and Student Subgroups

To investigate Research Question 3, differences among subgroups of students were examined to determine if teacher absences influenced any particular group of students more than others. The school division examined was not exceptionally diverse with the following percentages of student subgroups: 85% White, 7% Black, 14% disabled, and 22% disadvantaged. Regardless of the teacher background variables that were controlled (i.e., gender, level of degree, years experience), teacher absences were a significant predictor of student achievement on SOL tests (i.e., English, mathematics, science, social studies) for students in the following subgroups; Black, $R^2 = .142$, F(1, 214) = 35.733, p < .001, students with disabilities, $R^2 = .074$, F(1, 217) = 17.576, p < .001, and disadvantaged, $R^2 = .079$, F(1, 217) = 18.679, p < .001. Black students scored about 29% lower on SOL tests in English, mathematics, science, and social studies, than did White students. Students with disabilities scored about 20% lower on SOL tests (i.e.,

English, mathematics, science, social studies) than did students without disabilities. And, disadvantaged students scored about 25% lower on SOL tests (i.e., English, mathematics, science, social studies) than did students who were not disadvantaged. Table 9 summarizes the means and standard deviations for Black/White, disabled/non-disabled, and disadvantaged/non-disadvantaged. While teacher absences were a significant predictor of student achievement on SOL tests (i.e., English, mathematics, science, social studies), the *R* square values were relatively small, thus accounting for 14% (Black), 7% (disabled), and 8% (disadvantaged) of the variance.

Table 9

Means and Standard Deviations for Student Subgroup SOL Scaled Scores in English,

Mathematics, Science, and Social Studies over Three Academic Years (2009- 2012)

Student subgroup	M	SD
Black	460.36	40.37
White	489.75	32.08
Disabled	469.40	37.33
Non-disabled	489.23	32.71
Disadvantaged	464.60	35.71
Non-disadvantaged	489.88	49.95

Summary of Results

Analyses were conducted to determine if there were patterns among teachers' absences, if teacher absences predicted student achievement, or if teacher absences were more detrimental to certain student groups. ANOVA and sequential multiple regression analyses were employed and an alpha level of .05 was used for all statistical tests.

In determining if there were patterns among teachers' absences, gender was the only variable that was found to be statistically significant. On the average, females (M = 38.32) missed 12 more days than males (M = 26.81) over the three-year period studied or about four more days per year for each of the three years examined.

Based on the sequential multiple regression analyses, teacher absences were not found to be a predictor of student achievement in any subject area while controlling for any of the background variables. In the subject area of English, experience was found to be a significant predictor of student achievement in all cases examined. There were not significant predictors for student achievement in mathematics and the population was too small to examine science. In the subject area of social studies, gender of the teacher was found to be a significant predictor of student achievement in all cases examined with male teachers tending to have students who scored lower than female teachers.

Although the school division data did not reflect a particularly diverse student population, three subgroups were investigated for differences regarding teacher absences and student achievement. Regardless of the background variables, teacher absences were significant for students who were Black, disabled, or disadvantaged. In each subgroup, averaged SOL scaled scores for students who were Black, disabled, or disadvantaged were at least 20% lower than students who were White, nondisabled, and not receiving free lunch.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The research literature to date indicates that teacher absences may be related to student performance on standardized measure of achievement. "When regular teachers are not in the classroom, opportunities for students to learn are cut short" (Clotfelter et al., 2009, p.141). It is intuitively logical that student achievement will be higher with a quality teacher who is present at school every day. However, the evidence gained from the current investigation does not support the interpretation of a direct connection between teacher absence and student achievement. Conclusions from the results are examined further in this chapter and recommendations for further research are suggested.

Conclusions

Patterns of teacher attendance. Based on previous research (Clotfelter et al., 2009), one might expect that females miss more days than males. In the current investigation, it was found that females missed an average of 3.8 days more per year than males, a result comparable to the average of 3.2 days as reported by Clotfelter et al. (2009). Considering the ratio of females to males was about 3:1 and females missed four more days per year than males, it would seem the number of teacher absences per year within the division studied was relatively large. Teacher absences coupled with the reality that teachers who utilize sick leave days are often afforded personal leave and professional leave for professional activities that are scheduled during the school day, would lead to a logical prediction that teacher absences have a deleterious effect on student achievement (Clotfelter et al., 2009; Miller et al., 2008). However, the current study yielded no evidence that teacher absence negatively related to student achievement on a standardized measure of student performance. Other than female teachers having more absences than male teachers, the current investigation did not reveal any pattern of teacher attendance with regard to teacher experience or the teacher's level of degree.

The day of the week and time of year are potential factors that relate to teacher absenteeism. For example, Miller et al. (2008) found that teachers were absent most on Fridays (6.00%) and Mondays (5.14%) compared to 4.56%, 4.57%, and 4.39% of teachers who were

absent on Tuesday, Wednesday, and Thursday respectively. Such patterns potentially speak to some teachers taking advantage of long weekends. Additionally, patterns of teacher attendance may reveal statistically interesting results in considering teacher absences and the time of year. For example, teacher absences may be higher when taken adjacent to a school holiday or popular event such as a college or pro-league athletic game. Miller et al. (2008) also noted a teacher's commute to work and weather conditions as variables that may be related to the frequency of teacher absences. None of these factors were considered in the current investigation and certainly warrant further study in order to further the understanding of patterns and teacher absences..

Another important factor that should be examined is what is considered a teacher absence. School divisions define absences within policy and offer teachers an allotment of paid absences for reasons such as sick leave, personal leave, and professional leave. Regardless of the absence reason, teacher absences create a void in the classroom. Further examination of teacher absences with regard to planned versus unplanned absences and the impact on student achievement is potentially of interest. It seems logical that planning to be absent would permit a greater level of preparedness for the classroom teacher. Unplanned absences, which do not always allow for the classroom teacher to adequately prepare for instructional activities, may have a greater effect on student learning and achievement. The effect, if any, that planned versus unplanned absences have on student achievement were not considered in the current investigation, but open another avenue of research to consider in future research.

While the current investigation did not consider student absenteeism there may well be a relationship between student absenteeism and student achievement. For example, based on an extensive analysis of Philadelphia school data (Gottfried, 2009), there is some evidence that student achievement is related to the number of student absences. Though the effect does not seem to be as large for excused absences versus unexcused absences, student performance tends to decrease as the number of student absences increases. While more is yet to be learned about the relationship between student absences and student achievement, very little is known about the relationship between teacher absences and student absences. For instance, it may be curious to investigate if students tend to be absent on the same days that teachers are absent. Further investigations based on informationally rich data sets are needed to attempt to tease apart these complex relationships between the student's opportunity to learn, the student's actual learning, and the student's achievement performance.

Predictors of student achievement. Teacher absences were not found to be a significant predictor of student achievement in English, mathematics, science, or social studies. The teacher background variables (e.g., gender, experience, degree) were also regressed on student achievement to statistically control for their effects. Teacher experience was found to be a significant predictor of student achievement in English (i.e., teachers with greater experience tended to have students who scored higher) and gender was identified as being related to higher student achievement in social studies (i.e., male teachers tended to have students who scored lower than female teachers). More about both findings follows.

Although the effect was small, teacher experience was found to be a significant predictor of student achievement in English. Overall, as teacher experience increased, student achievement in English increased. The change in mean English SOL scaled scores, after the first five years of teaching to the most experienced teachers (i.e., 20 plus years of experience), increased 33%. While teacher quality was not examined in the current study, further research is needed to understand the differences in teacher quality and years of experience. A spurious relationship may exist in which teacher experience and student achievement may seem to be related, but in fact, are influenced by another factor. One example of a spurious relationship is a scenario where more experienced teachers are assigned to teach students with high ability and less experienced teachers are assigned to teach students with low ability. Student ability may very well be a confounding factor, thus influencing teacher experience and student achievement, rather than teacher experience influencing student achievement. "Findings in an area as broadly defined as teacher quality are often difficult to interpret, given the many ways of identifying and measuring the qualifications, characteristics, and practices that contribute to the concept of what makes a good teacher" (Goe & Stickler, 2008b, p. 1). Goe & Stickler's (2008b) four lenses for examining teacher quality (i.e., teacher qualifications, teacher characteristics, teacher practices, teacher effectiveness), offer a beginning for determining what it means to be an effective teacher.

As was noted in Chapter 4, the highest number of English teacher absences was found to occur for those teachers with six to 10 years of experience. Since it has been established that females missed more days than males, it is reasonable to consider that female English teachers with less than 10 years of experience probably missed work due to maternity leave and responsibilities surrounding the care of young children. Examination of the absence data confirmed that FMLA for English teachers occurred between four and 10 years of experience.

After this period of experience, absences decrease by 13% and then increased to the second highest number of teacher absences for teachers with 20 years and more experience (i.e., the average across the three years studied was 45.88). Clotfelter et al. (2009) also found that teachers with more experience missed more days. Thus, the findings are counterintuitive, as teacher experience increases, teacher absences tend to increase, and student achievement tends to increase. Differences in teacher effectiveness and the ability to appropriately measure the notion can produce apparently contradictory findings (Goe & Stickler, 2008b) such as these. Since the findings are related to absences that were confirmed periods of extended leave related to FMLA, the notion that planned versus unplanned teacher absences should be considered for future research. Also, teachers with more experience may be more effective overall than teachers with less experience, regardless if the absences are planned or not. Additional research may suggest that the positive relationship in the current investigation is isolated or may reveal results that support that teacher absences are indeed not a factor, thus suggesting that a larger emphasis be placed on understanding the specific variables that contribute to a quality teacher and student learning and performance.

A second predictor of student achievement found in the analyses was that gender was found to be a significant predictor of students' social studies scores. While no social studies teachers took extended leave due to FMLA during the three-year period examined in the study female social studies teachers (M = 31.35, SD = 17.48) were absent more on the average than male social studies teachers (M = 27.05, SD = 13.13). Whereas it was anticipated that achievement scores would be lower for students with teachers who had more absences, total teacher absences were not found to be significant predictors of social studies scores. In addition, the average social studies scores for the three-year period examined were significantly higher (i.e., 15% higher) for students of female social studies teachers (M = 490.18, SD = 37.13) than for students of male social studies teachers (M = 474.76, SD = 34.13). While the finding could be an anomaly, it would behoove researchers to investigate the teacher characteristics that validate higher student achievement. "For example, some teachers may contribute to overall student achievement gains by virtue of their collegiality, leadership ability or impact on school culture. Such practices do appear to benefit schools and may play an important, if unseen, role in students' success' (Goe & Stickler, 2008b, p. 14).

Overall, the current investigation did not reveal consequential evidence that teacher absenteeism negatively impacts student achievement, even though some evidence in the research literature has indicated that student achievement decreased with increased teacher absenteeism (Clotfelter et al., 2009; Miller et al., 2008). Further research is warranted to consider the effects of all teacher quality variables on student learning and student achievement. If anything, the current investigation suggests that teacher absenteeism should be considered along with other teacher characteristics for ensuring that every student benefits from instruction provided by a quality teacher. "Because few teacher qualifications, teacher characteristics, or teacher practices are strongly and consistently related with improved student achievement, it is wise when making decisions about teacher hiring and placement to also consider the ways in which teachers may contribute to outcomes such as student self-esteem, student attendance, teacher collaboration and collegiality, and school culture." (Goe & Stickler, 2008b, p. 11)

Teacher absences and student subgroups. Although the R^2 values were small (i.e., 14%) Black, 7% disabled, 8% disadvantaged) and regardless of teacher background factors (i.e., gender, level of degree, years of experience) teacher absences were significantly related to the student achievement recorded for students who were Black, disabled, or disadvantaged. Student achievement in the three subgroups scored at least 20% lower on SOL tests in English, math, science, and social studies. The analyses of student subgroups revealed consistent results with Clotfelter at al. (2009); teacher absences were related to the achievement performance of minorities and disabled and low-income students. Thus, it appears that teacher effectiveness possibly coupled with teacher presence is of utmost importance for closing achievement gaps among students in the named populations. Research indicates that teachers are absent more in schools where there is a high number of minority and impoverished students (Clotfelter et al., 2009; Miller, 2012). "These race-based differentials are statistically significant, but it's not clear how educationally significant they are" (Miller, 2012, p. 13). Many factors may be confounded with teacher absence and the influence that it has on student performance for minority, disabled, and disadvantaged students. For example, a teacher with little to no experience may be assigned to teach students in one or more of the named subgroups. It is plausible that the limited experience may influence student learning and performance rather than the teacher's absences. Certainly student influences, such as student attendance, have an effect on learning and performance. Although, the current investigation and supporting results from the literature offer

evidence that teacher absences seem to be more detrimental among certain student subgroups, many variables remain to be considered for understanding the educational significant of each (i.e. teacher absences). Teacher and student variables and their possible effects on student learning and achievement performance are illustrated in Figure 1.

Although, the population in the current investigation was not considered to be widely diverse, the findings among the subgroups indicate that educational leaders should be concerned about teacher absences when teachers' assignments include minority, disabled, and low-income students. Certainly the impact of the findings for schools with widely diverse populations would be of greater concern. Further research is warranted regarding teacher absences and teacher effectiveness to ensure that minority students and disabled and disadvantaged students have an equal opportunity to learn and perform.

Limitations

The investigation of teacher absenteeism as it relates to student achievement was conducted with many variables to consider. Controlling for teacher background variables and student demographic variables added a considerable amount of perplexity to the study. The lack of evidence of a significant relationship between teacher absenteeism and student achievement may be related to the complexity of the relationships among the variables studied and may well vary as a function of the school division studied and its culture regarding teacher absenteeism.

Teacher accountability has risen to the attention of policy makers and student performance is the key factor. The literature provides ample support for the importance of teacher quality and suggests the importance of teacher presence. For this reason, teacher quality and attendance should not be considered in isolation. Perhaps, teacher absenteeism would be appropriately investigated as part of Goe's (2007) teacher characteristics lens. Research reviewed for the current study spoke independently of teacher quality and teacher attendance. Common sense would suggest that teacher quality is not possible without teacher presence, and vice versa. Interestingly though, it is plausible to that a teacher's management ability, including preparedness for absences, could be a factor of a quality teacher. Regardless of the common sense notion or the effective management of a quality teacher, it would be beneficial to investigate teacher attendance as a component of teacher quality. Such research would provide school officials with valuable information in the present era of teacher accountability. Figure 1

illustrates some of the key factors for both the teacher and the student as they may be related to student learning and achievement performance.

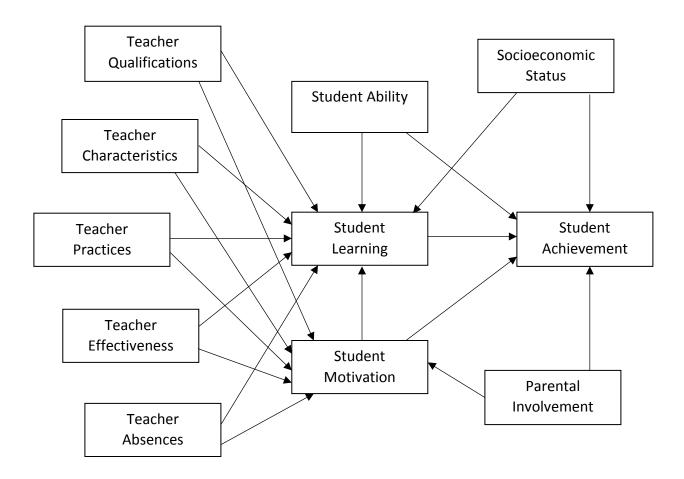


Figure 1. Model of possible relationships among teacher and student variables and their effects on student learning and student achievement.

Ultimately, no evidence was found that teacher absences were related to student achievement. Other factors not investigated but, in fact, may have contributed to the findings: school culture, student absences, student motivation, student ability, and even the quality of the substitute when the regular classroom teacher is absent. What the model of teacher and student effects on student achievement presented in Figure 1 represents is that the relationships among the various teacher, student, and parent variables in addition to cultural aspects of the school are complex and that most certainly student performance on standardized measures of achievement is not a linear function of any one of these single (or other unnamed) variables. For example,

school culture and the climate that exists in the workplace have been investigated and in some settings teachers were found to be absent more when the culture of the school added stress and strain to a teacher's workload (Rosenblatt & Shirom, 2005, 2006; van Dick & Wagner, 2001).

Thus, variables that exist within school culture could promote teacher absenteeism, even among quality teachers, and affect student performance on measures of achievement. Such variables may include lack of support from the administration, negative collegial relationships, low socioeconomic status, low student motivation, student absences, and negative student behavior. The listed variables and other school culture influences add another layer of complexity to understanding teacher absenteeism and how it relates to student achievement. "The professional culture of a school—the norms, formal and informal, that guide teachers' behavior—has a facet related to absence" (Miller, 2012, p.5). Future studies of teacher absenteeism should investigate school culture and perhaps even classroom culture as additional factors that may possibly influence the relationship between teacher absenteeism and student achievement performance.

Other than the consideration of student demographic variables (e.g, race, disability, disadvantaged), the quality of a student learner was not investigated in the current study and should also be included in future research on the topic. Certainly as a single variable, teacher absence does not seem to translate directly to low student achievement. Student factors, such as, ability, motivation, and attendance surely contribute to a student's learning and ultimately a student's achievement performance. It is important to understand such variables and how they influence student outcomes, but also, how they relate to teacher quality. Student factors that influence the teacher's desire to come to work were not considered in the current investigation, but may add yet another factor to consider when examining the relationship between student performance on measures of achievement and teacher absenteeism.

Substitutes

Directly related to teacher absenteeism and its effect on student learning and performance is the substitute teacher. The fact is that when a classroom teacher is absent, a substitute is required. Substitutes have varying levels of content specific knowledge and are not always selected based on their individual level of expertise. Additionally, the quality of instructional plans left for the substitute to execute may be limited, particularly if the teacher's absence was

unplanned. Or, the substitute's ability to deliver the plans effectively may be a contributing factor to lower student achievement. These are all factors that need to be investigated to examine their relationships, if any, to student performance on standardized measure of achievement.

Validity and Reliability of Data

The nature of the reporting and data collection processes associated with teacher absenteeism and student achievement performance may pose fidelity issues and thus viewed as a potential limitation. At question, as in all research endeavors, is the reliability and validity of the data employed in the analyses. Typically, when standardized measures of student achievement are used, questions of reliability and validity have been addressed by test developers and those charged with implementing the testing system. In contrast, relatively little is known regarding the rigor of the teacher absenteeism reporting and monitoring systems and is in need of investigation. Because, in recent years, teacher and student linked data have been made more generally available for research purposes, the question of the accuracy of teacher absenteeism data must be addressed (Goe & Stickler, 2008b; Miller, 2012). "When individual students are linked to specific teachers, it is possible to use sophisticated statistical methods, such as hierarchical linear modeling, to examine teacher effects. Currently, only a limited number of linked data sets exist; but as states more toward collecting and maintaining student and teacher information with unique but anonymous identifiers, more revealing research may be possible than has been seen previously" (Goe & Stickler, 2008b, p. 16).

Summary

Although the results of the study are not generalizable beyond the findings that are consistent with those reported by others (e.g., Clotfelter et al., 2009), the level of inquiry regarding the potential impact of teacher absences on student achievement should not be ignored. The current investigation added to the literature in the following ways: female teachers are absent more than male teachers, teacher experience is a significant predictor of student achievement in English, teacher gender is a significant predictor of student achievement in social studies, and teacher absences have a negative effect on certain student subgroups (i.e., Black, disabled, disadvantaged). Although the evidence from the current study as well as from the available research literature (Clotfelter et al., 2008; Miller et al., 2008) offers minimal support

validating the notion that teacher absences negatively influence student achievement, the findings do suggest that additional variables should be included in future research investigating the relationship between teacher absenteeism and student achievement performance. As Figure 1 illustrates, the influence of teacher absences, among many other factors, probably effects student learning and student achievement in a significant, but relatively small manner. The complexity of the variable relationships as illustrated in Figure 1 suggests that "one size does not fit all" (Goe & Stickler, 2008b).

Recommendations

Although, division policy was not a component of this investigation, it may be worthwhile to consider leave policies in order to compare patterns in teacher absences across school divisions. While all school divisions have established leave policies for school employees, they are not exactly the same and, even if they are, most likely are not implemented in identical ways. For instance, it is plausible that some local policies regarding leave are too permissive or are permissively operated, particularly for teachers with high years of experience (Clotfelter et al., 2009; Miller et al., 2008).

The findings presented in the literature and in the current investigation offer a challenge to future researchers to connect the many variables that contribute to teacher quality and student achievement. "While the sophisticated models that yield value-added scores can estimate teachers' supposed contributions to their students' learning, they do not illuminate what in particular makes teachers effective" (Goe & Stickler, 2008b, p. 15). Quality teaching is of paramount importance, particularly in the present state of teacher accountability. Understanding the complexity of teacher quality and teacher absenteeism may promote student academic success, financial savings for the school division, and improved management of leave policies. Since, "teachers are the most important school-based determinant of students' academic success" (Miller, 2012, p.1), it seems worthwhile to ensure that every aspect of a quality teacher, including teacher absenteeism, be investigated to guarantee that student achievement is not impeded.

REFERENCES

- Aarons, D. I. (2010, February 3). Teacher-dismissal powers found to affect absences; when chicago principals were allowed to dismiss teachers, attendance improved. *Education Week*, 29(20), 8.
- Adequate Yearly Progress. (2004, September 10). *Education Week*. Retrieved April 16, 2011, from http://www.edweek.org/ew/issues/adequate-yearly-progress/.
- Atkin, R. S., & Goodman, P. S. (1984). Methods of defining and measuring absenteeism. In P. S. Goodman, R. S. Atkin & Associates (Eds.), *Absenteeism* (pp. 47-109). San Francisco, California: Jossey-Bass Publishers.
- Banerjee, A., & Duflo, E. (2006, Winter). Addressing absence. *Journal of Economic Perspectives*, 20(1), 117-132.
- Bill and Melinda Gates Foundation, Press Room. (2013, January 8). Measures of effective teaching project releases: Final research report [Press Release]. Retrieved from http://www.gatesfoundation.org/Media-Center/Press-Releases/2013/01/Measures-of-Effective-Teaching-Project-Releases-Final-Research-
- Center for American Progress. (2010, October 20). *Idea of the day: Importance of improving teacher quality*. Retrieved from http://www.americanprogress.org/issues/general/news/2010/10/20/8519/idea-of-the-day-importance-of-improving-teacher-quality/
- Chadwick-Jones, J. K., Brown, C., & Nicholson, N. (1973). Absence from work: its meaning, measurement, and control. *International Review of Applied Psychology*, 22, 137-156.
- Chadwick-Jones, J. K., Nicholson, N., & Brown, C. (1982). *Social psychology of absenteeism*. New York, New York: Praeger publishers.
- Chaudhury, N., Hammer, J., Kremer, M., Muralidharan, K., & Rogers, F. H. (2006, Winter).

 Missing in action: Teacher and health worker absence in developing countries. *Journal of Economic Perspectives*, 20(1), 91-116.
- Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2007a). *How and why do teacher credentials*matter for student achievement? (National Bureau of Economic Research No. 12828).

 Retrieved June 16, 2013from http://www.nber.org/papers/w12828
- Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2007b). *Teacher credentials and student achievement in high school: A cross-subject analysis with student fixed effects.* (National

- Bureau of Economic Research No. 13617). Retrieved June 16, 2013from http://www.nber.org/papers/w13617
- Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2009). Are teacher absences worth worrying about in the United States? *Education Finance and Policy*, *4*(2), 115-149.
- Darling-Hammond, L. (2010). Evaluating teacher effectiveness (Center for American Progress).
- Das, J., Dercon, S., Habyarimana, J., & Krishnan, P. (2007). Teacher shocks and student learning. *The Journal of Human Resources*, 42(4), 820-862.
- Districts experiment with cutting down on teacher absence. (2008, April 30). *Education Week*, 27(35), 115-149.
- District Management Council. (2004). *Management advisory brief: Reducing teacher absenteeism*.
- Donaldson, M.L. (2011). *Principal's approaches to developing teacher quality* (Center for American Progress).
- Ehrenberg, R. G., Ehrenberg, R. A., Rees, D. I., & Ehrenberg, E. L. (1991, Winter). School district leave policies, teacher absenteeism, and student achievement. *The Journal of Human Resources*, 26(1), 72-105.
- Elizabeth, J. (2001, January 7). A substitute for education: When the teacher's away. *Post-Gazette*, Retrieved from http://www.post-gazette.com/headlines/20010107subs2.asp
- Ensuring Fair and Reliable Measures of Effective Teaching. (2013, January). *MET Project Policy and Practice Brief*. Retrieved June 15, 2013, from http://metproject.org/downloads/MET_Ensuring_Fair_and_Reliable_Measures_Practitioner_Brief.pdfhttp://www.edweek.org/ew/issues/teacher-quality/
- Goe, L. (2007, October). The link between teacher quality and student outcomes: A research synthesis. *National Comprehensive Center for Teacher Quality*. Retrieved June 23, 2013 from http://secc.sedl.org/orc/resources/LinkBetweenTQandStudentOutcomes.pdf
- Goe, L., Bell, C., & Little, O. (2008a, June). Approaches to evaluating teacher effectiveness: A research synthesis. *National Comprehensive Center for Teacher Quality*. Retrieved June 23, 2013 from http://www.wested.org/schoolturnaroundcenter/docs/goe-research-synthesis.pdf

- Goe, L. (2013, April 23). Putting emphasis on teacher quality. Message posted to http://blogs.edweek.org/edweek/op_education/2013/04/putting_a_focus_on_teacher_qua.html?print=1[4/28/2013%202:44:10%20PM]
- Goe, L., & Stickler, L.M. (2008b, March). Teacher quality and student achievement: making the most of recent research. *Teacher Quality Research & Policy Brief*. Retrieved June 13, 2013 from http://www.gtlcenter.org/sites/default/files/docs/March2008Brief.pdf
- Gottfried, M.A. (2009). Excused versus unexcused: How student absences in elementary school affect academic achievement. *Educational Evaluation and Policy Analysis*, 41(4), 392-415.
- Guilfoyle, C. (2013, Spring). Quantifying teacher effectiveness. *An Information Brief from ASCD, Policy Priorities*, 19(1), 1-3, 5-7.
- Hill, J. M. M., & Trist, E. L. (1953). A consideration of industrial accidents as a means of withdrawal from the work situation. *Human Relations*, *63*, 357-380.
- Hill, J. M. M., & Trist, E. L. (1955). Changes in accidents and other absences with length of service. *Human Relations*, 8, 121-152.
- Hill, T. S. (1982, March). You can't afford for teachers to be out, so take these steps now to stop absenteeism. *Updating school board policies*, 13(3), 1-4.
- Jacob, B. A. (2010). *Do principals fire the worst teachers?* (National Bureau of Economic Research No. 15715). Retrieved from http://www.nber.org/papers/w15715
- Jacobson, S. L. (1989, Spring). The effects of pay incentives on teacher absenteeism. *The Journal of Human Resources*, 24(2), 280-286.
- Jacobson, S. L. (1990). Attendance incentives and teacher absenteeism. *Planning & Changing*, 21(28), 78-93.
- Johns, G., & Nicholson, N. (1982). The meanings of absence: new strategies for theory and research. *Research in Organizational Behavior*, *4*, 127-172.
- Kandtardzic, M. (2003). Data mining: Concepts, models, methods, and algorithms. Hoboken, NJ: Wiley-Interscience.
- Keith, T. (2005). Multiple regression and beyond. Boston: Pearson/Allyn-Bacon.
- Keller, B. (2008, March 18). Studies link teacher absences to lower student scores. *Education Week*, 27(28), 9.

- Kyriacou, C., & Sutcliffe, J. (1978). Teacher stress: Prevalence, sources, and symptoms. *British Journal of Education Psychology*, 48, 159-167.
- Kyriacou, C., & Sutcliffe, J. (1978, March). A model of teacher stress. *Educational Studies*, 47(1), 1-6.
- Lazarus, R., & Launier, R. (1978). Stress-related transactions between person and environment. In L. A. Pervin & M. Lewis (Eds.), *Perceptions in interactional psychology* (pp. 297-327). New York: Plenum Press.
- Long, J., & Ormsby, J. G. (1987, November). Stamp out absenteeism. *Personnel Journal*, 13(3), 1-4.
- Martocchio, J. J. (1994). The effects of absence culture on individual absence. *Human Relations*, 47(3), 243-262.
- Miller, R. (2008). Tales of teacher absence (Center for American Progress).
- Miller, T. (2012). *Teacher absence as a leading indicator of student achievement* (Center for American Progress).
- Miller, R. T., Murnane, R. J., & Willett, J. B. (2008, June). Do teacher absences impact student achievement? Longitudinal evidence from one urban school district. *Educational Evaluation and Policy Analysis*, 30(2), 181-200.
- Muchinsky, P. M. (1977). Employee absenteeism: A review of the literature. *Journal of Vocational Behavior*, *10*, 316-340.
- Nicholson, N., & Johns, G. (1985). The absence culture and the psychological contract who's in control of absence? *Academy of Management Review*, 10(3), 397-407.
- No Child Left Behind Act. (2001). Public Law 107-110, 2002.
- Norton, M. (1998, Winter). Teacher absenteeism: A growing dilemma in education. *Contemporary Education*, 69(2), 95.
- Pedhazur, E.J. (1997). *Multiple regression in behavioral research: Explanation and prediction* (3rd ed.). Fort Worth, TX: Harcourt Brace.
- Pitkoff, E. (1993, March). Teacher absenteeism: What administrators can do. *NASSP Bulletin*, 77(551), 39-45.
- Podgursky, M. (2003, Summer). Fringe benefits. *Education Next*, pp. 71-76.
- Pohl, J. M. (2001). Teacher absenteeism. Subjournal, 2(2), 27-31.

- Policies allow districts to cut corners with substitutes. (2007, September 12). *Education Week*, 27(3), 10.
- Rankings & estimates (National Education Association). NEA Research. (2010). Retrieved from http://www.nea.org/assets/docs/HE/NEA_Rankings_and_Estimates010711.pdf
- Rhodes, S. R., & Steers, R. M. (1990). *Managing employee absenteeism*. Reading, Massachusetts: Addison-Wesley Publishing Company.
- Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005, March). Teachers, schools, and academic achievement. *Econometrica*, 73(2), 417-458.
- Rockoff, J. E. (2004, May). The impact of individual teachers on student achievement: Evidence from panel data. *The American Economic Review*, 94(2), 247-252.
- Rosenblatt, Z., & Shirom, A. (2005). Predicting teacher absenteeism by personal background factors. *Journal of Educational Administration*, 43(2), 209-225.
- Rosenblatt, Z., & Shirom, A. (2006, August). School ethnicity and governance influences on work absence of teachers and school administrators. *Educational Administration Quarterly*, 42(3), 361-384.
- Sawchuk, S. (n.d.) What studies say about teacher effectiveness. *EWA Research Brief*. Retrieved June 23, 2013 from http://www.ewa.org/site/DocServer/TeacherEffectiveness.final.pdf?docID=2001
- Sawchuk, S. (2008, November 5). Analysis tracks teachers' use of discretionary leave time; new study examines four years from large urban district. *Education Week*, 28(11), 6.
- Scott, K. D., & Wimbush, J. (1991). Teacher absenteeism in secondary education. *Educational Administration Quarterly*, 27(4), 506-529.
- Smith, G. G. (2001). Increasing teacher attendance. Subjournal, 2(1), 8-17.
- Steers, R. M., & Rhodes, S. R. (1978). Major influences of employee attendance: A process model. *Journal of Applied Psychology*, 63(4), 391-407.
- stress. 2011. In *Merriam-Webster Online Dictionary*. Retrieved March 7, 2011, from http://www.merriam-webster.com/dictionary/stress.
- Studies link teacher absences to lower student scores. (2008, March 19). *Education Week*, 27(28), 9.
- Substitute teacher resume sample. Retrieved March 3, 2011, from Job Interview & Career Guide: http://www.job-interview-site.com/substitute-teacher-resume-sample.html

- Teacher Quality. (2011, July 8). *Education Week*. Retrieved June 1, 2013, from http://www.edweek.org/ew/issues/teacher-quality/
- Toppo, G. (2013, February 12). Teacher absenteeism puts students at a loss. USA Today. Retrieved February 19, 2013, from http://www.usatoday.com/story/news/nation/2013/02/12/teacher-absenteeism-puts-students-at-a-loss/1914515/.
- van Dick, R., & Wagner, U. (2001). Stress and strain in teaching: A structural equation approach. British Journal of Educational Psychology, 71, 243-259.
- W.Va. district cuts incentives for teachers to come to work. (2009, February 11). *Education Week*, 28(21), 5.
- Winkler, D. R. (1980, January). The effects of sick-leave policy on teacher absenteeism. *Industrial and Labor Relations Review*, *33*(28), 232-240.
- Woods, R. C., & Montagno, R. V. (1997). Determining the negative effect of teacher attendance on student achievement. *Education*, *118*(2), 307-316.

APPENDIX A

SUMMARY TABLE OF TEACHER QUALITY LITERATURE EXAMINED BY GOE

Table A1

Teacher Quality

Author(s)	Research Study
Betts, Zau, and Rice (2003)	Determinants of Student Achievement: New Evidence from San Diego
Boyd, Gorssman, Lankford, Loeb, and Wyckoff (2005)	How Changes in Entry Requirements Alter the Teacher Workforce and Affect Student Achievement
Carr (2006)	Carr (2006), The Determinants of Student Achievement in Ohio's Public Schools
Cavalluzzo (2004)	Is National Board Certification an Effective Signal of Teacher Quality?
Clotfelter, Ladd, and Vigdor (2006)	Teacher-Student Matching and the Assessment of Teacher Effectiveness
Darling-Hammond (2000)	Teacher Quality and Student Achievement: A Review of State Policy Evidence
Darling-Hammond, Holtzman, Gatlin, and Heilig (2005)	Does Teacher Preparation Matter? Evidence About Teacher Certification, Teach for America, and Teacher Effectiveness
Decker, Mayer, and Glazerman (2004)	The Effects of Teach for America on Students: Findings from a National Evaluation
Goe (2002)	Legislating Equity: The Distribution of Emergency Permit Teachers in California
Goldhaber and Anthony (2005)	Can Teacher Quality be Effectively Assessed? National Board Certification as a Signal of Effective Teaching
Goldhaber and Brewer (1999)	Teacher Licensing and Student Achievement
Hanushek, Kain, O'Brien, and Rivkin (2005)	The Market for Teacher Quality
Harbison and Hanushek (1992)	Educational Performance of the Poor: Lessons from Rural Northeast Brazil

Note. Adapted from Goe (2007), The Link Between Teacher Quality and Student Outcomes: A Research Synthesis.

(continued)

Table A1 (continued)

Author(s)	Research Study
Harris and Sass (2007)	Teacher Training, Teacher Quality and Student Achievement
Hill, Rowan, and Ball (2005)	Effects of Teachers' Mathematical Knowledge for Teaching on Student Achievement
Kane, Rockoff, and Staiger (2006)	What Does Certification Tell Us About Teacher Effectiveness?
McColsky, Stronge, Ward, Tucker, Howard, Lewis, and Hindman (2005)	Teacher Effectiveness, Student Achievement, and National Board Certified Teachers
Monk (1994)	Subject Area Preparation of Secondary Mathematics and Science Teachers and Student Achievement
Rockoff (2004)	The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data
Rowan, Correnti, and Miller (2002)	What Large-scale, Survey Research Tells Us About Teacher Effects on Student Achievement: Insights from the Prospects Study of Elementary Schools
Sanders, Ashton, and Wright (2005)	Comparison of the Effects of NBPTS Certified Teachers with Other Teachers on the Rate of Student Academic Progress
Vandevoort, Amrein-Beardsley, and Berliner (2004)	National Board Certified Teachers and Their Students' Achievement

Table A2

Teacher Characteristics

Author(s)	Research Study					
Dee (2004)	The Race Connection: Are Teachers More Effective with Students Who Share Their Ethnicity?					
Ehrenberg, Goldhaber, and Brewer (1995)	Do Teachers' Race, Gender, and Ethnicity Matter?					
Goddard, Hoy, and Hoy (2000)	Collective Teacher Efficacy: Its Meaning, Measure, and Impact on Student Achievement					
Leana and Pil (2006)	Social Capital and Organization Performance: Evidence From Urban Public Schools					

Note. Adapted from Goe (2007), The Link Between Teacher Quality and Student Outcomes: A Research Synthesis.

Table A3

Teacher Practices

Author(s)	Research Study
Borman and Kimball (2005)	Teacher Quality and Educational Equality: Do Teachers with Higher Standards-Based Evaluation Ratings Close Student Achievement Gaps?
Cohen and Hill (1998)	Instructional Policy and Classroom Performance: The Mathematics Reform in California
Frome, Lasater, and Cooney (2005)	Well-Qualified Teachers and High-Quality Teaching: Are They the Same?
Gallagher (2004)	Vaughn Elementary's Innovative Teacher Evaluations System: Are Teacher Evaluation Scores Related to Growth in Student Achievement?
Heneman, Milanowski, Kimball, and Odden (2006)	Standards-Based Teacher Evaluation as a Foundation for Knowledge- and Skill-Based Pay
Holtzapple (2003)	Criterion-Related Validity Evidence for a Standards-Based Teacher Evaluation System
Jacob and Lefgren (2005)	Principals as Agents: Subjective Performance Measurement in Education
Kannapel and Clements (2005)	Inside the Black Box of High-Perfuming High-Poverty Schools
Kimball, White, Milanowski, and Borman (2004)	Examining the Relationship Between Teacher Evaluation and Student Assessment Results in Washoe County
Marcoulides, Heck, and Papanastasiou (2005)	Student Perceptions of School Culture and Achievement: Testing the Invariance of a Model
Matsumura, Garnier, Pascal, and Valdés (2002)	Measuring Instructional Quality in Accountability Systems: Classroom Assignments and Student Achievement
Matsumura, Slater, Junker, Peterson, Boston, Steele, and Resnick (2006)	Measuring Reading Comprehension and Mathematics Instruction in Urban Middle Schools: A Pilot Study of the Instructional Quality Assessment

Note. Adapted from Goe (2007), *The Link Between Teacher Quality and Student Outcomes: A Research Synthesis*.

(continued)

Table A3 (continued)

Author(s)	Research Study
McCaffrey, Hamilton, Stecher, Klein, Bugliari, and Robyn (2001)	Interactions Among Instructional Practices, Curriculum, and Student Achievement: The Case of Standards-Based High School Mathematics
Milanowski (2004)	The Relationship Between Teacher Performance Evaluation Scores and Student Achievement: Evidence from Cincinnati
Newmann, Bryk, and Nagaoka (2001)	Authentic Intellectual Work and Standardized Tests: Conflict or Coexistence?
Rowan, Chiang, and Miller (1997)	Using Research on Employees' Performance to Study the Effects of Teachers on Students' Achievement
Schacter and Thum (2004)	Paying for High- and Low-Quality Teacher
Smith, Lee, and Newmann (2001)	Instruction and Achievement in Chicago Elementary Schools
Wenglinsky (2000)	How Teaching Matters: Bringing the Classroom Back Into Discussions of Teacher Quality
Wenglinsky (2002)	How Schools Matter: The Link Between Teacher Classroom Practices and Student Academic Performance

Table A4

Teacher Effectiveness

Author(s)	Research Study				
Aaronson, Barrow, and Sanders (2003)	Teachers and Student Achievement in the Chicago Public High Schools				
Noell (2006)	Value Added Assessment of Teacher Preparation				
Nye, Konstantopoulos, and Hedges (2004)	How Large are Teacher Effects?				
Rivkin, Hanushek, and Kain (2005)	Teachers, Schools, and Academic Achievement				
Thum (2003)	Measuring Progress Toward a Goal Estimating Teacher Productivity Using a Multivariate Multilevel model for Value-Added Analysis				

Note. Adapted from Goe (2007), *The Link Between Teacher Quality and Student Outcomes: A Research Synthesis.*

APPENDIX B

MEANS AND STANDARD DEVIATIONS FOR TEACHERS ABSENCES AND

TEACHER CHARACTERISTICS

Variable	N	TA	DP	EL	JD	PPD	PL	PFL	SFD	S
Teachers	112	35.13	9.95	6.00	2.13	3.13	3.75	4.69	5.54	19.45
		(18.73)	(13.18)	(4.24)	(1.33)	(2.15)	(1.57)	(3.76)	(4.68)	(12.47)
Gender										
Females	81	38.32	10.52	6.00	1.58	3.44	3.90	5.16	5.64	20.73
		(20.14)	(13.52)	(4.24)	(0.92)	(2.18)	(4.63)	(4.13)	(4.10)	(13.04)
Males	31	26.81	2.50		3.75	1.82	3.35	3.50	5.24	16.15
		(10.84)	(2.12)		(1.06)	(1.47)	(1.31)	(2.29)	(6.58)	(10.34)
Degree										
Bachelor's	75	68.11	19.68	9.00	2.71	5.92	7.11	8.42	11.45	38.09
		(17.49)	(13.67)		(0.92)	(2.28)	(1.61)	(3.42)	(4.96)	(11.31)
Master's	37	36.41	9.15	3.00	3.75	3.26	4.04	5.51	4.86	19.74
		(21.24)	(12.94)		(1.06)	(1.95)	(1.45)	(4.3)	(4.01)	(14.7)
Years of Ex	perier	nce								
0-5a	17	34.91	16.25		3.00	3.28	3.47	4.88	7.88	17.06
		(21.46)	(20.07)			(2.14)	(1.35)	(2.75)	(8.37)	(9.63)
6-10a	33	38.41	11.71		1.50	3.44	3.91	4.39	5.48	20.15
		(20.02)	(12.49)		(1.32)	(2.64)	(1.42)	(3.43)	(4.47)	(12.19)
									(cont	tinued)

Appendix B (continued)

Variable	N	TA	DP	EL	JD	PPD	PL	PFL	SFD	S
11-15a	32	30.97	5.70		4.50	3.12	3.72	4.32	4.24	18.81
		(16.96)	(8.6)			(1.96)	(1.67)	(2.72)	(4.76)	(13.44)
16-20a	13	32.08	5.50	6.00	1.00	2.50	3.96	4.00	6.83	17.42
		(17.37)		(4.24)		(2.45)	(2.1)	(3.77)	(4.06)	(12.4)
20+a	17	39.18	1.63		2.00	2.80	3.63	6.28	6.21	23.21
		17.38	(1.11)			(1.4)	(1.55)	(6.3)	(1.03)	(14.14)

Note. Standard deviations are in parentheses. TA = total absences; DP = dock pay; EL = emergency leave; JD = jury duty/other; PPD = partial pay day; PL = personal leave; PFL = professional leave; SFD = sick family death; S = sick.

a Years of experience.

APPENDIX C
MEANS AND STANDARD DEVIATIONS FOR SCHOOLS AND TEACHER
ABSENCES

School	TA	DP	EL	JD	PPD	PL	PFL	SFD	S
Jefferson	44.09	13.90			3.71	3.62	7.79	6.67	25.88
	(25.73)	(14.60)			(1.07)	(1.44)	(6.07)	(9.81)	(18.26)
Lincoln	35.00	7.50	3.00	2.67	2.61	3.59	4.82	4.28	20.44
	(20.64)	(9.56)		(2.02)	(2.62)	(1.68)	(3.08)	(3.76)	(14.26)
Madison	31.61	5.42		1.00	3.50	3.70	4.25	6.41	17.10
	(13.48)	(8.55)			(2.12)	(1.70)	(3.35)	(4.55)	(8.23)
Roosevelt	33.16	12.00	9.00	2.00	2.77	3.97	3.64	4.71	18.36
	(17.42)	(20.45)			(2.02)	(1.34)	(1.88)	(3.61)	(9.92)
Washington	34.39	11.90		2.00	3.46	3.79	3.68	6.82	16.66
	(15.03)	(12.68)		(1.00)	(2.3)	(1.81)	(3.22)	(5.83)	(9.89)

Note. Standard deviations are in parentheses. TA = total absences; DP = dock pay; EL = emergency leave; JD = jury duty/other; PPD = partial pay day; PL = personal leave; PFL = professional leave; SFD = sick family death; S = sick.

APPENDIX D

PERMISSION TO USE FOUR LENSES FOR EXAMINING TEACHER QUALITY TABLE

Initial contact email message on June 22, 2013

SUBJECT: RESEARCH AND PERMISSION TO USE A TABLE FROM PUBLICATION Hello Dr. Goe,

I am a high school administrator and am also completing my dissertation this summer at Virginia Tech. I am researching teacher absenteeism and student achievement. Part of my research includes a section on teacher quality. I have enjoyed reading your research on this topic and am writing to inquire about permission to use a table from one of your publications entitled Teacher Quality and Student Achievement: Making the Most of Recent Research. I have unsuccessfully attempted to locate the publisher online to seek permission through NCCTQ. Since I have not been able to locate this organization directly, I am hopeful that you may be able to offer some assistance.

I appreciate your time and any recommendations that you may have in fulfilling my request.

I look forward to hearing from you.

Response to initial contact email message on June 22, 2013

The organization is now the Center on Great Teachers and Leaders (http://www.gtlcenter.org/), but it won't be necessary for you to contact them. I can give you permission. Yes, you may use the table. Good luck with your research and completion of your dissertation.

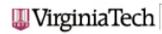
Laura

Laura Goe, Ph.D.

Research Scientist (ETS)
Understanding Teaching Quality Research Group
Educational Testing Service
Rosedale Road, MS 02-T
Princeton, NJ 08541
609-619-1648 (cell)
lgoe@ets.org

APPENDIX E

INSTITUTIONAL REVIEW BOARD APPROVAL



Office of Research Compliance

Institutational Review Board North End Center, Suite 4120, Virginia Tech

300 Tumer Street NW Blacksburg, Virginia 24061 540/231-4606 Fax 540/231-0959

email irb@vt.edu

website http://www.irb.vt.edu

MEMORANDUM

DATE: June 3, 2013

TO: James Richard Craig, Janet Leigh Womack

FROM: Virginia Tech Institutional Review Board (FWA00000572, expires April 25, 2018)

The Costs of Teacher Absenteeism: Are Teacher Absences an Indicator of PROTOCOL TITLE:

Student Achievement?

IRB NUMBER:

Effective June 3, 2013, the Virginia Tech Institution Review Board (IRB) Chair, David M Moore, approved the New Application request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

http://www.irb.vt.edu/pages/responsibilities.htm

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Expedited, under 45 CFR 46.110 category(ies) 5 Approved As:

Protocol Approval Date: June 3, 2013 June 2, 2014 Protocol Expiration Date: Continuing Review Due Date*: May 19, 2014

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY An equal opportunity, affirmative action institution

Date*	OSP Number	Sponsor	Grant Comparison Conducted?

^{*} Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.

APPENDIX F PERMISSION TO USE TEACHER AND STUDENT DATA

	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
•	
June 24, 2013	
June 24, 2013	
To Whom It May Concern:	
10 Whom it way concern	
Janet Womack has permission to use both teacher and stude	ent achievement data from
in her study "The Costs of Teacher Absenteeism: Are	Teacher Absences an Indicator of Student
Achievement?"	
Achievement:	•
Assistant Superintendent of Personnel	· ·