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The Impact of Teacher Absenteeism on Student Performance: The Case of the Cobb County School District

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**The Impact of Teacher Absenteeism on Student Performance:
The Case of the Cobb County School District**

A Practicum Paper
Submitted in Partial Fulfillment
of the Requirements for the:

Master of Public Administration

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Executive Summary

Common sense that is supported by research tells us that when a teacher is absent from the classroom, student learning is disrupted. When that teacher is repeatedly absent, student performance can be significantly impacted in a negative way. The more days a teacher is out of the classroom, the lower their students tend to score on standardized tests. Nationally, teachers are absent from the classroom on average 10 days per year. Cobb County School District teachers are out of the classroom on average 14 days per year. There are other reasons to be concerned with teacher absenteeism:

- Financial costs to the school system – The Cobb County School District spent approximately \$8.5 million dollars to pay for classroom and clinic nurse substitutes during the 2008/2009 school year.
- Students attending school in low socioeconomic areas experience more teacher absences. Research tells us that teachers tend to be absent more often from low-socioeconomic schools, which has a detrimental affect on students who are already struggling.
- Unmonitored usage of leave in a school can affect the absence behavior of employees, leading to more leave usage.

This analysis was conducted in the Cobb County School District, a large suburban school district with a total number of 114 schools, more than 6,800 classroom teachers, and more than 106,000 students. Data was collected on 453 third-grade teachers and 7683 third-grade students from 64 elementary schools. A regression analysis was performed on the variables of all Cobb County third-grade teacher absenteeism rates and their student scores on the math and reading sections on the Criterion Reference Competency Test

(CRCT). A regression analysis was also performed on the percentage of students receiving free and/or reduced lunch per school and those students' scores on the math and reading sections of the CRCT.

The results of the analysis support previous research findings that higher teacher absenteeism leads to lower student math scores on standardized tests. This study also found that students attending low-socioeconomic area schools scored significantly lower on the reading and math sections of the Criterion Reference Competency Test (CRCT). Recommendations to address this issue include better collection and monitoring of teacher absenteeism data, requiring teachers to make personal contact with the principal or other administrator when reporting absences, and implementing incentive programs to improve teacher attendance.

Introduction

“I know no safe depository of the ultimate powers of the society but the people themselves; and if we think them not enlightened enough to exercise their control with a wholesome discretion, the remedy is not to take it from them but to inform their discretion.” Thomas Jefferson made this statement to illustrate that citizens of our country are called upon to reach conclusions and make decisions on important matters and having a good education makes them able to make informed decisions on important issues.

Much attention has been focused on the attendance of children in schools and the impact that frequent student absences have on student learning, so much so that parents may face criminal sanctions if their children miss a certain number of days of school. However, the same attention needs to be focused on the attendance of teachers who are charged with the responsibility of teaching these children. By being absent, are teachers failing to fulfill the vision of our founding fathers of educating all? An education analyst who assisted in writing the report *A Nation at Risk* named Paul Copperman was quoted as saying “Each generation of Americans has outstripped its parents in education, in literacy, and in economic attainment. For the first time in the history of our country, the educational skills of one generation will not surpass, will not equal, will not even approach, those of their parents” (*A Nation at Risk*, 1983, p. 4).

From experience I have learned that if employee attendance is allowed to become a problem in a school, it will affect other employees who also begin to take time off from work. There needs to be an awareness of how pervasive this problem might be and consistency among all schools about what is expected from teachers and staff.

The purpose of this research is to explore and answer the question “Does teacher absenteeism affect student performance?” It was thus hypothesized, “Higher teacher absenteeism leads to lower student performance.” Teacher absenteeism is measured simply by counting the number of a teacher’s absences during a given year, including sick leave, bereavement leave, and personal leave. Student performance was measured by students’ scores on the reading and math portions of the Criterion Reference Competency Test (CRCT), which is the standardized test used throughout Georgia public schools and nationally. Studies like this are rare because it is extraordinarily difficult to detect the effect of teacher absenteeism on student performance since there are so many other factors that can impact student learning. The student’s individual attendance will have an impact on what they learn; parental support will have an effect, as well as whether or not that child had enough sleep or ate breakfast that day. Typically, data on teacher absences would be housed in the Human Resources department. Data on student performance would be housed in another department such as the Accountability department and the two departments would rarely compare data for this kind of study.

This issue arose during the performance of my duties as an Investigations Manager in the Human Resources Department for the Cobb County School District and my assignment to an Attendance Policy Task Force charged with the development of an attendance policy for faculty and staff. The Cobb County School District is a large urban school district with a total number of 114 schools (68 Elementary Schools, 25 Middle Schools, and 16 High Schools), more than 6,800 classroom teachers, and more than 106,000 students. Data was collected on 453 third-grade teachers and 7683 third-grade students from 64 elementary schools.

In the performance of my duties, I have consistently seen what I consider to be higher teacher absenteeism rates among lower performing teachers, those teachers having job performance problems that are being addressed by my office. This observation is supported by research by Pitkoff (1993) in which he found that teachers who receive low performance ratings were absent significantly more often than teachers rated as satisfactory. I therefore became concerned about this issue and the possible effect high absenteeism rates may have on student achievement generally.

There are several reasons why this research is important and potentially beneficial. First, research has already shown that teacher absenteeism can have a negative affect on learning. Research conducted by Raegen Miller and colleagues at Harvard University has shown that after using a substitute, teachers often have to re-teach material, restore order, and rebuild relationships with students. Researchers also found that when a teacher is absent ten days from class, student performance in math is significantly reduced (Miller et al.). Studies also show that teachers are absent more often in elementary schools, which has a significant impact on these students who are developing their knowledge and skills at an increased pace during these years (Pitkoff, 1993). Another important finding in a study by Clotfelter et al. was that higher teacher absenteeism is associated with more student absenteeism, which will also lead to poor student performance as the student is not present in class to participate and learn. It seems reasonable to conclude that a student may not view school attendance as important if their classroom teacher is absent from class regularly.

Second, teacher absenteeism has been shown to be more prevalent in lower-income schools. In studies conducted at Duke University in 2007, Charles Clotfelter et

al. found that schools having more low socioeconomic and minority students also had higher teacher absence rates and lower student test scores. They found that the teachers in the poorest schools in North Carolina took an average of one extra sick day per year when compared to wealthier schools and also found that teacher absences are also a problem in developing countries, where absence rates were found to range from 20 to 44 percent in Kenya and India (Clotfelter et al., 2007). This study found that teacher absences in the United States are around five percent, which is significantly lower than the absenteeism rates in developing countries, but compared to the absenteeism rates of United States workers in other occupations at less than three percent, the rate of teacher absences in the United States is fairly high (Clotfelter et al., 2007, p. 9). This study drew a commonsense conclusion, supported by statistical evidence, showing that students whose teacher takes more days off of work score lower on state achievement tests. Of particular concern in this study was the finding that absences occur with greater frequency in lower-income schools.

In a 2002 study of California Charter Schools serving low socioeconomic status students, researchers concluded that student performance on standardized tests is influenced by their socioeconomic status (Slovacek, Kunnan, and Kim, 2002). David Rusk, former mayor of Albuquerque, N.M., gave a speech about the importance of education and the relationship between economic status and performance. He discussed a 1966 study conducted by the then U.S. Office of Education that found that the economic status of a student's family as well as that of the other students in that school were the strongest predictors of academic achievement. The study also found that low-income students learn best when they are surrounded by middle-class students in middle-class

schools. Rusk conducted a study of sixty elementary schools in Madison and Dane County in New Mexico and found that a student's socioeconomic status was the most important factor affecting academic performance as measured by standardized tests (Rusk, 2002).

Third, there are the immediate and expensive financial costs to the given school district. There is the initial cost of hiring substitute teachers and the reallocation of administrative resources involved in making arrangements for substitute teachers, as well as recruitment, hiring, and training of substitutes. The Cobb County School District has a department that is dedicated to the management of the automated SubFinder system, employing two full-time workers. When a teacher will be absent, they either call in the individual absence or enter it into WebConnect, a computer software program. When an absence is entered, SubFinder will try to find a substitute teacher to fill that job. SubFinder will start calling available substitute teachers up to two weeks before the job starts and keep calling until the job is filled. If no one accepts the job, it changes to "failed to fill." Substitutes can also see and accept jobs on the Internet on the WebConnect system.

There are also expenses incurred in processing new substitutes who have to be fingerprinted in order to check for any possible criminal background. As the turnover rate for substitute teachers in the Cobb County School District is approximately 33 percent of approximately 3,500 substitutes per year, the costs are repetitive and ongoing. According to Kathleen Frey in an article published in the *Marietta Daily Journal*, the use of substitute teachers costs the City of Marietta, employing 626 teachers, \$500,000 in one school year. Statistics gathered for the 2008/2009 school year show that the Cobb County

School District spent \$ 8,352,996.48 paying for substitutes to fill in for 6,800 classroom teachers and clinic nurses, though the district only budgeted \$4,595,164 for that year (Cobb County School District). Raegen Miller found in his research that the estimated cost of paying for substitute teachers is approximately four billion dollars per year nationally. Finding quality substitutes to fill all the open jobs is also a problem (Scott, 1998).

Another reason for Human Resources officials to be concerned about this issue is when staff members are allowed to utilize leave without any scrutiny by administrators, their behavior can directly affect the leave behavior of other staff in the building. Researchers found evidence that an individual teacher's usage of leave is affected by the behavior of their peers (Bradley, Green, and Leeves, 2007). Many teachers begin to feel that exercising good attendance is not important to the school principal, so their attendance habits can begin to change, leading them to take more time off. Cobb County teachers are given thirteen sick days each school year, three of which can be used for personal leave. The unused sick leave can be carried over to the following year(s). Research also shows that the more days of sick leave given to an employee, the more days off they will take (Ehrenberg et. al.).

Background

A Nation at Risk is a report issued in 1983 by the National Commission on Excellence in Education. The basic message of this report was that American schools are failing miserably. This report sparked a wave of local, state, and federal education reform efforts. This report states "part of what is at risk is the promise first made on this continent: All, regardless of race or class or economic status, are entitled to a fair chance

and to the tools for developing their individual powers of mind and spirit to the utmost. This promise means that all children by virtue of their own efforts, completely guided, can hope to attain the mature and informed judgment needed to secure gainful employment, and to manage their own lives, thereby serving not only their own interests but also the progress of society itself” (p. 1). The following were specific indicators of risk included in this report:

- When administering the most basic test of reading, comprehension, and writing, 23 million American adults were found to be functionally illiterate.
- International comparisons of student achievement done in 1973 showed that American students never scored first or second on 19 academic tests and came in last seven times when compared with other industrialized nations.
- Approximately thirteen percent of all 17-year-olds in the United States were found to be functionally illiterate, with rates among minority youth running as high as forty percent.
- Average achievement of high school students on most standardized tests is now lower than 26 years ago when Sputnik was launched.
- Over half the population of gifted students did not match their tested ability with comparable achievement in school.
- Performance on the Scholastic Aptitude Tests (SAT) shows a consistent decline from 1963 to 1980
- College Board achievement tests show a decline in performance in English and physics.

- The percentage of students scoring above a 650 (considered superior) has dramatically declined
- Many 17-year-olds do not possess the "higher order" intellectual skills expected. Almost 40 percent cannot draw inferences from written material; only twenty percent can write a persuasive essay; and only one-third can solve a complex mathematics problem requiring several steps.
- There was a steady decline in science achievement scores of U.S. 17-year-olds as measured by national assessments of science in 1969, 1973, and 1977.
- Between 1975 and 1980, remedial mathematics courses in public 4-year colleges increased by 72 percent and now constitute one-quarter of all mathematics courses taught in those institutions.
- Average tested achievement of students graduating from college is also lower.
- Business and military leaders complain that they are required to spend millions of dollars on costly remedial education and training programs in such basic skills as reading, writing, spelling, and computation. The Department of the Navy reported that 25 percent its recent recruits were not able to read at a ninth grade level, the minimum needed simply to understand written safety instructions. Without remedial work they cannot even begin the sophisticated training essential in much of the modern military.

It should be noted that in 1983 the SAT national average score in reading was 503 and in math was 494. In 2008, SAT national average score for reading was 502, which showed a decrease, and in math was 515, an increase in scores (www.collegeboard.com).

A Nation at Risk preceded the passage of the Improving America's Schools Act of 1994 (IASA), which reauthorized the Elementary and Secondary Education Act of 1965 (ESEA), and the Goals 2000: Educate America Act of 1994. These acts encouraged teaching and learning and set high achievement standards for children. All of these acts were precursors to the No Child Left Behind Act (NCLB), which was signed into law by President George W. Bush in January, 2002. The NCLB was new legislation that reauthorized the Secondary Education Act (ESEA) of 1965, which was the first legislation passed providing federal funding for the education of students in low socioeconomic situations. The NCLB contained dramatic changes in the way things were done because this reauthorization demanded accountability among school systems. The purpose of NCLB was to also provide more choices for parents, a greater degree of accountability for results, more flexibility for communities and individual states, and it required the use of proven education methods in the classroom. This law also required schools to provide annual reports and to administer standardized tests to students so that their progress could be measured in a quantifiable way.

In 2001, Georgia lawmakers passed the Georgia Academic Placement and Promotion Policy (O.C.G.A. 20-2-282 - 20-2-285) which actually made it illegal to promote certain students to the next grade if they had not demonstrated competency in their current grade level material. This law requires that no third grade student can be promoted to the fourth grade if the student does not achieve grade level on the third-grade Criterion Reference Competency Test (CRCT) in reading; no fifth or eighth grade student will be promoted to the next grade if the student does not achieve grade level on the

CRCT in reading and mathematics. The CRCT assesses a sample of the knowledge and skills that educators agree comprise a complete curriculum for each grade level.

Each year, students in first through eighth grade are given the Criterion Referenced Competency Tests (CRCT). The academic areas of reading, English/language arts and mathematics are tested. Science and social studies are also tested on all third through eighth graders. The Georgia Academic Placement and Promotion Policy states that no third-grade student will be promoted to the fourth grade if the student does not achieve grade level performance on the third grade CRCT in reading (Georgia DOE, 2009). In the 2009 Georgia administration of the CRCT, 88 percent of Georgia third-graders met or exceeded the standard set for reading. Seventy-eight percent of Georgia third-graders met or exceeded the standard set for math. This represents a one percent increase in reading and a seven percent increase in math scores over the 2008 CRCT administration. This also means that 12 percent of Georgia third-grade students taking the CRCT did not pass the reading portion of the CRCT and 22 percent did not pass the math portion.

Literature Review

A review of existing research shows that there is empirical evidence to support the hypothesis that higher absenteeism by teachers contributes to lower student performance. Statistical evidence shows that students whose teachers miss more days of class have lower scores on state achievement tests. Raegen Miller looked at the impact of teacher absences on fourth-grade test scores in a large, urban school district and found that ten teacher absences within a school year causes a significant loss in math

achievement. Though there is evidence from one older research study involving 700 New York schools in 1991 which concluded that the absences of teachers were not “largely associated with student test performance,” the researchers state in their conclusion that “one should not conclude from this ...that teacher absenteeism has no impact on student learning. Our analyses focus on pass rates on a set of standardized tests, they thus do not permit one to conclude anything about how teacher usage of leave days affects students whose academic performance is well above the minimum passing level on exams or how it affects aspects of learning not measured by the exams” (Ehrenberg et al., p. 99).

The remaining studies that I located support the hypothesis that higher teacher absenteeism contributes to lower student performance. Statistical evidence from several other studies shows that students whose teachers miss more days of class have lower scores on state achievement tests. Raegan Miller and colleagues looked at the impact of teacher absences on fourth-grade test scores in a large, urban school district and found that ten teacher absences within a year causes a significant loss in math achievement, reducing student performance by 3.3 percent of a standard deviation (Miller et al.). They also found that student performance is lowered by one or two percent for each ten days that a teacher is absent. Clotfelter et al. found that students whose teacher had ten days of absences showed a decline of 1.7 percent of a standard deviation in math and a .9 percent decline in reading, less than what was found by Miller, Murnane, and Willett (2007). Their findings have a significant importance to students in the elementary school years, especially in kindergarten through second grade when they are learning the skills needed to be successful readers. Woods and Montagno (1997) studied the impact of teacher absenteeism on student reading scores on the standardized Iowa Test of Basic Skills

(ITBS). They found that students with teachers who had fewer absences had “significantly larger improvements in grade equivalency.” They conducted research on third-grade students and found that the teachers with the highest number of absences had students with lower standardized test scores, thus concluding that teacher absenteeism does have a significant negative impact on student achievement. Another study found that there is a negative correlation between student performance and high teacher absenteeism, stating that the more days a teacher was absent, the more the level of student performance decreased (Uehara, 1999). Research conducted in Indonesia to study the performance of students in developing countries found that “higher teacher absence significantly correlates with lower student scores in the mathematics test” (Suryadarma et al. 2006, p. 423).

In studies conducted at Duke University, Charles Clotfelter and colleagues found that schools having more low socioeconomic and minority students also had higher teacher absence rates, and that then leads to lower student test scores. Clotfelter found that the teachers in the poorest schools in North Carolina took an average of one extra sick day per year compared to teachers in wealthier schools. Clotfelter et al. also found that absences affect low-income students more and that teachers at schools with higher free and reduced lunch recipients, also typically low-income schools, had more absences (p.15).

In an investigative article done for the *Chicago Tribune*, Darnell little and Tracy Dellangela found through a six-year analysis of teacher absenteeism that the highest absenteeism problems were found in a certain cluster of failing schools. That district began publishing teacher absence rates in directories given out to parents. The absences

ranged from 2 to 35 days per teacher among the 500 elementary schools. Miller and colleagues found in their research big differences in teacher absence rates among schools in the same district. In an interview in the *Associated Press* in 2009, Raegen Miller was quoted as saying the "professional culture of a school and the relationship between teachers and administrators affect absenteeism" (Zuckerbrod, 2008). Other researchers found evidence that an individual teacher's usage of leave is affected by the behavior of their peers (Bradley, Green, and Leeves, 2007).

In another study, researchers concluded that "students in a classroom eventually lose the desire to learn when the regular teacher is frequently absent and the delivery of instruction is by an array of substitute teachers" (Bruno et al., 2007). Differences in teacher absenteeism rates across large urban geographical areas threaten the promotion of equity and excellence in the schools involved. In an article titled "Are teacher absences worth worrying about in the US?" researchers examined teacher attendance in North Carolina, looking at how often absences occur, the number of days taken off, and the effect on student performance. This study drew a commonsense conclusion, supported by statistical evidence, that students whose teachers miss more days for sickness score lower on state achievement tests. Clotfelter and colleagues found that students in elementary grades have lower tests scores when they have a teacher who takes more days off (Clotfelter et al.).

In another study by Miller, Murnane, and Willett (2002), they found that out of 2,594 teachers from 75 schools, teachers took an average of 5.13 sick and personal days off per year, with a range of 2.5 to 8 days per year. The range of Cobb County teacher absences for sick and personal leave for the 2007/2008 school year was from 2.25 to 57.5

days, with an average of sick and personal leave taken being 10 days (training leave is not included). In another area of their research, data was gathered on 285 fourth-grade teachers and their student's scores on the annual state mathematics test. Researchers found a small but statistically significant negative impact of teacher absences on the student math scores (Miller et al.).

In a report to the Wisconsin Association of School Boards, Craig Hubbell states that attendance improves when teachers are required to report their absences to their direct supervisor (2008). A report for the North Carolina Department of Public Instruction in May 2007 concluded that having teachers report in person instead of only calling in to an automated telephone system reduces absenteeism (Scott, Vaughn, Wolfe, and Wyant, 2007). Pitkoff also found that absenteeism rates are higher in schools where the principal does not require teachers to make personal contact with a supervisor to report an absence (Pitkoff, 1993).

A study conducted by Raegen Miller in October 2008 for the Center for American Progress titled "Tales of Teacher Absence: New Research Yields Patterns that Speak to Policy Makers", reports that on average, teachers in the United States are absent between nine and ten days per school year. This results in an individual student having a substitute teacher for the equivalent of two-thirds of a school year during his school career from kindergarten through high school. In the twelve year period, the total number of days missed by the teacher would be 108 to 120 days, which is two-thirds of a typical 180 day school year. Cobb County School teachers were absent from the classroom an average of 14 days during the 2007/2008 school year when training leave is included in the total.

Overall, Miller concluded that teacher absences do have a negative affect on student performance.

As noted, the benefits of reducing teacher absenteeism include better student discipline and student performance as well as savings to the school district for money paid to substitute teachers. In the Cobb County School District, substitute teachers who are not required to have a college degree and are not allowed to work longer than 29 consecutive days, are paid \$81.00 per day. Substitute teachers are only required to have a high school diploma or its equivalent (GED). Supply teachers, who work for thirty consecutive days or longer and are required to have a college degree, are paid \$102.00 per day.

A common theme throughout the research reviewed is that new teachers take less time off. After they gain tenure and therefore have more job security, they take more days off. As they approach retirement age, they then begin to save their sick-leave time to apply towards retirement credit. Beginner teachers use an average of 4.8 days of sick leave per school year and teachers with five to ten years of experience take an average of eight or more days. Female teachers took more leave time than males, attributing much of that time taken off to maternity leave (Clotfelter et al., p. 10). This study also showed that elementary schools had higher absentee rates than middle or high schools, with high schools having the least. They also found that when classes were covered by certified substitutes the decline in achievement was lower than when they were not certified (Clotfelter et al., p.16).

Of particular interest to me was that school level requirements about reporting absences can affect the rates of teacher absences. Each school in Cobb County differs in

whether or not the principal requires teachers and staff to make personal contact with them when they will be absent. Some principals do require personal contact and some do not; there is no consistency. I have seen in my experience that schools where the principal requires teachers and staff to make personal contact with them when they will be absent have lower rates of absenteeism than those whose principals only require teachers to contact the automated SubFinder system to arrange for a substitute to cover their classroom.

According to Miller, principals who work in schools with more low-income and minority students will tell you that teacher absenteeism is a problem. In a study by Pitkoff, he found that teachers with lower job performance ratings as measured by principal ratings had higher absenteeism rates. Existing research shows that teacher absenteeism can affect student achievement which can have long-lasting and damaging effects on student performance. It is not unreasonable to expect that our staff report to work on a regular basis.

Methodology

This research was conducted using a quantitative cross-sectional study, utilizing the NCSS statistical analysis software program. Computerized data from the Cobb County School District was obtained in Excel spreadsheets for use in the study. Data regarding 453 teachers and 7683 students from 64 schools, was collected. A regression analysis was performed on the variables of all Cobb County third-grade teacher absenteeism rates and their student scores on the math and reading sections on the Criterion Reference Competency Test (CRCT). The nature of the data to be collected was in the form of secondary data, obtained from existing computer databases operated

by the Cobb County School District, data collected for payroll administration purposes. Student CRCT test score data was collected from each CCSD elementary school for all third-grade students. The data was examined and then compared to the attendance rate of the individual third-grade classroom teacher. The relationship between X (teacher absences) and Y (student scores on CRCT reading and math sections) was analyzed using linear regression by performing statistical analysis of existing data sets.

I also compared the data from elementary schools that failed to make annual yearly progress and compared those to schools that were not given that designation. I also found which schools have teacher attendance problems and correlated the high absenteeism to lower student test scores on the Criterion Reference competency Test (CRCT). I found that there is a direct correlation between poor teacher attendance and poor student performance within the Cobb County School District, meaning as teacher absenteeism rates increased, student test scores decreased.

Statistics obtained from the State Department of Education in Georgia revealed that 85.6 percent of Cobb County schools made Adequate Yearly Progress (AYP) status. Five of those schools not meeting AYP requirements were elementary schools. AYP resulted from the No Child Left Behind Act (NCLB) and is an annual measure of student performance and participation on statewide assessments and other academic indicators. AYP requires schools to meet standards in three areas: academic performance, test participation, and another indicator. Four of Cobb County School District's elementary schools failed to make Adequate Yearly Progress (AYP) status for the 2007/2008 school year: Argyle, Dowell, Hollydale, and Milford Elementary schools. Cobb County School District as a whole was in the Needs Improvement (NI) category for the 2008 year. To be

removed from NI status you must meet AYP two years consecutively.

When looking at statewide performance on the CRCT for the 2007/2008 school year, 88 percent, 87 percent, and 71 percent of third-grade students in our state met or exceeded the standards set for reading, English/language Arts, and mathematics, respectively. 2007/2008 reading and English/language arts scores increased three and one percent, respectively, when compared to 2006/2007 scores. The math portion of the 2008 CRCT was based on the new curriculum and could not be compared to the previous year CRCT. Eighty-eight percent of third-grade students met or exceeded the standard in reading, while 12 percent of Cobb County third-graders did not pass.

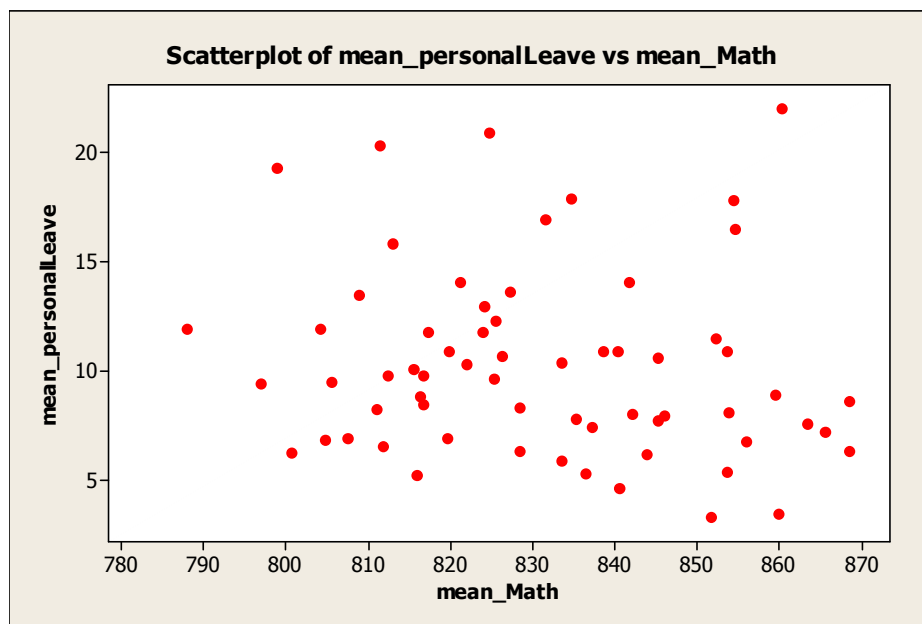
Findings

I performed a regression analysis in order to find out if a relationship between selected variables exists and to show how much one variable could be explained by the other. The first analysis was conducted to determine if the variation in math and reading scores could be explained by the total leave taken by their individual teachers. The first regression analysis was performed using the variables of Scaled Score Math Total versus Total Leave Taken. The math scores of 7680 students were analyzed.

The regression analysis showed that the comparison is useful. Looking at the analysis of variance, the P-value was equal to zero. Since this is lower than .05 it shows that there is strong evidence to support that there is a relationship between the student's math score and total leave taken by their teacher. Though the comparison was significant and useful to predict the math scores based on teachers total leave taken, the R-Squared value of just .02 percent is small. The R-Squared value indicates the amount of variation is explained by the model, so a higher R-Squared value is better since it indicates you

have captured a good amount of the variation. This R-Squared value means that just 0.2 percent of the variability in math scores is explained by total leave taken, so I can conclude that though the relationship is significant, there may be other factors that influence the math scores. Looking at the scatter plot from the NCSS program, I could see a linear descending relationship between the two variables. As the total days of leave taken gets higher, the math scores get lower.

Figure 1. Mean personal leave and mean math scores, 07/08

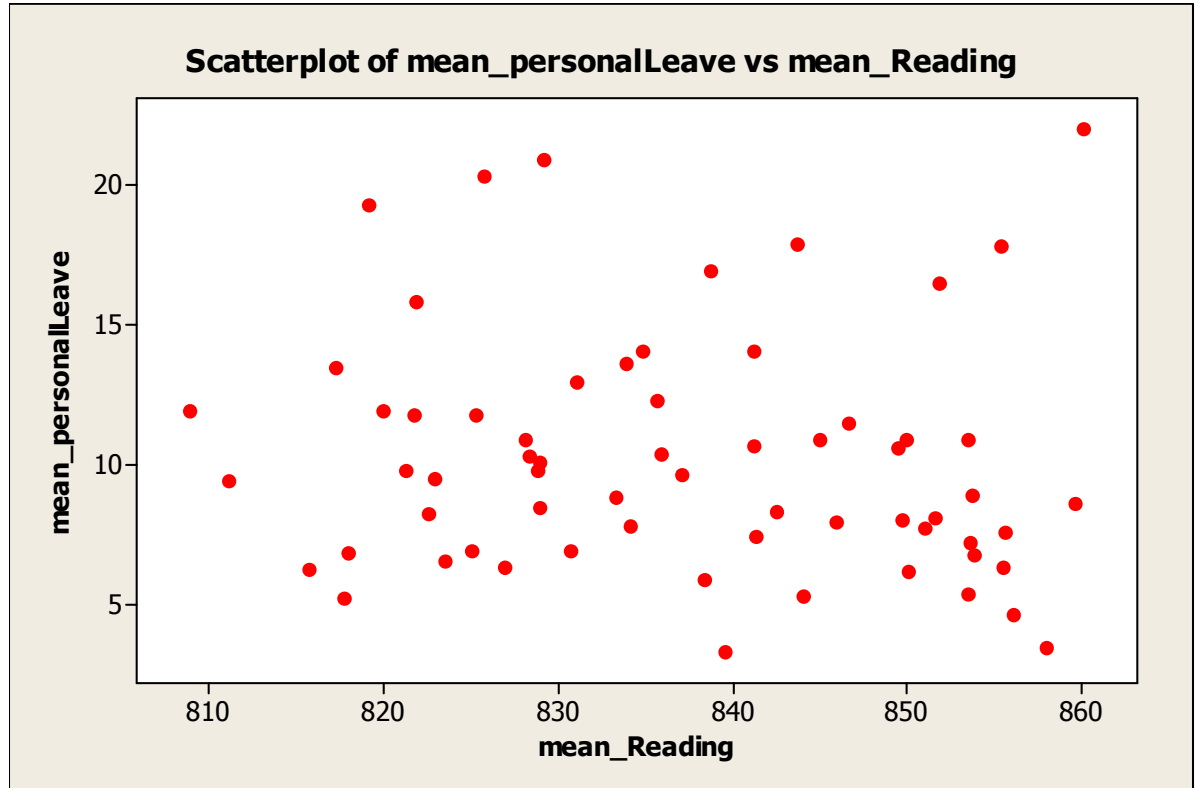


You can't see a clear relationship between average personal leave and average math scaled scores. The points are all scattered around the graph. When we performed the regression between these two variables the relationship was statistically significant but very weak.

The second regression analysis was performed using the variables of Scaled Score Reading Total versus Total Leave Taken. The scores of 7661 third-grade students were analyzed. The regression analysis showed that the comparison is not useful. Looking at the analysis of variance table of the model above, the P-value is equal to 0.074, which is

greater than .05. Therefore, I do not have strong evidence to say that there is a relationship between the reading score and total leave taken.

Figure 2. Mean personal leave and mean reading score, 07/08



I was unable to perform an ANOVA test to find out if the math and reading scores for different values of leave taken were the same or different. ANOVA (Analysis of Variance) is used when we want to find out if the different groups have the same average or not. In other words, we want to know if all groups have the same behavior or if they are statistically different from each other. The ANOVA test compares variability within groups (inside the groups) and variability between groups. If the calculated variability within groups is higher, then I don't have evidence to say the groups are different. If the variability between groups is higher then I can say the groups are statistically different. We use ANOVA to compare grouped data, however, to compare properly, all groups

must have the same variance. The data that comprise each comparison group must vary in the same way, so an ANOVA test could not be done because the groups have different variability and therefore the results would not be reliable.

The Levene's test is a test that shows us if groups have the same variance or not. If the P-value is greater than 0.05, I don't have strong evidence to say the variances are equal. The Levene's Test of Scaled Score Reading versus Total Leave Taken resulted in a P-value of .005. Due to the results, I could not run ANOVA, however, when looking at the graphs one can clearly see the variability of the reading and math scores getting higher as the total leave taken gets higher. This indicates that there is a relationship between the variability of the scores and the total leave taken. When teachers are absent more often, the score results get more variable.

During my research, I began to question whether or not the schools in low-socioeconomic areas would have statistically significant lower CRCT scores. I proceeded to gather data on the percentage of all elementary school students at each school who received a free or reduced lunch, which is an indicator of what schools are in low-socioeconomic areas. I used Minitab software to fit two regression models in order to determine the following:

- 1) To determine if there is a significant relationship between the average scale reading score, the percentage of student's receiving free and/or reduced lunches, and average short-term leave.
- 2) To determine if there is a significant relationship between the average scale math score, the percentage of student's receiving free and/or reduced lunches, and average short-term leave usage.

To fit those two models I used both “average reading scaled score” and “average math scaled score” as response variables and I used “percentage of free and reduced lunch recipients” and “average personal leave” as predictor variables. I already knew the single variable “average personal leave” was not useful to predict math and reading scores, however, sometimes when another variable is added to the regression model, the old variables can become useful.

Table 1.

<u>1st Regression Analysis:</u>						
Response: mean_Reading						
Predictors: % of Free & Reduced Lunch and Mean_PersonalLeave						
The regression equation is mean_Reading = 857 - 41.6 % of Free and reduced Lunch - 0.168 mean_personalLeave						
Predictor	Coef	SE Coef	(2)T	P	VIF	
Constant	857.232	1.705	502.79	0.000		
% of Free and reduced Lunch	-41.639	1.914	-21.75	0.000	1.004	
mean_personalLeave	-0.1675	0.1384	-1.21	0.231	1.004	
S = 4.69662 R-Sq = 88.7% R-Sq(adj) = 88.4%						
Analysis of Variance(1)						
Source	DF	SS	MS	F	P	
Regression	2	10586.1	5293.1	239.96	0.000	
Residual Error	61	1345.6	22.1,	Total	63	11931.7

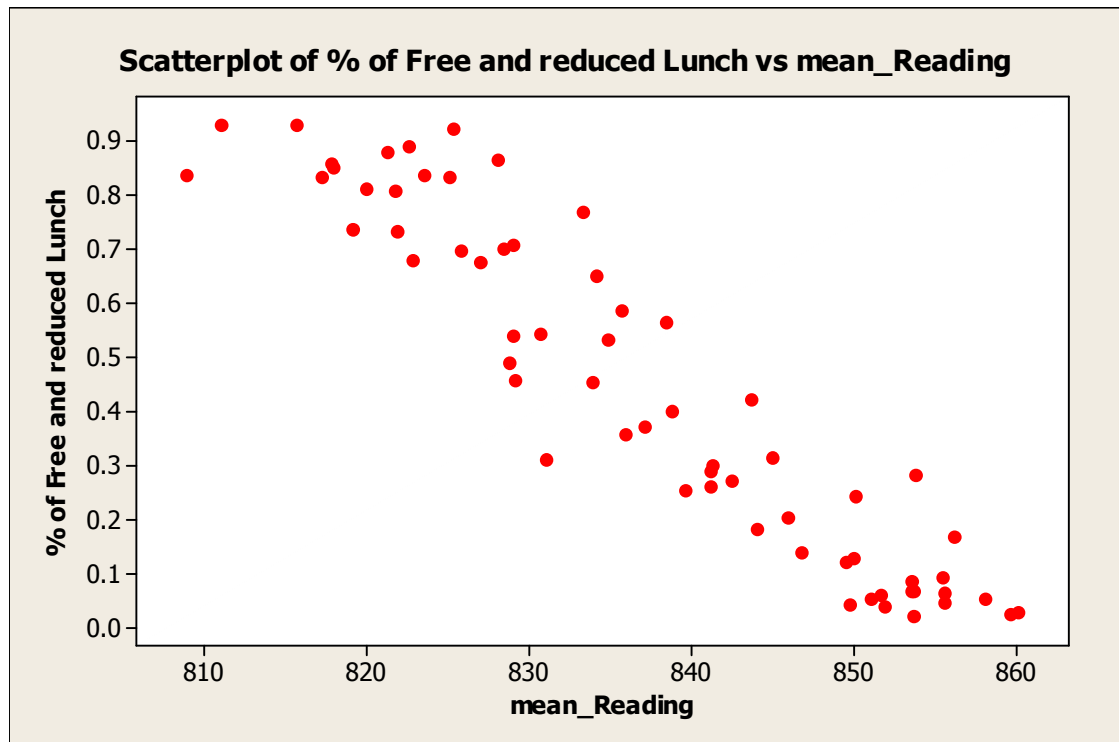
The new comparison is significant and useful to predict the scaled reading scores. Looking at the analysis of variance table (1), the P-value is equal to 0 which means I have enough evidence to say at least one of the model’s predictors is useful to explain the students’ reading scores. Although the model is statistically significant, just one of the predictors is useful. If one looks at the T-test of the predictors (2) the “percent of free and reduced lunch” has a P-value equal to 0. It means the predictor is useful to explain the students’ scores; however, the predictor “mean personal leave” is still not useful to predict the reading scores. Its P-value is 0.231 which is bigger than my significance level, which is 0.05. The R-Squared of 88.4 percent means that this model explains 88.4 percent of the variability in the scores which means it is a very good indicator. I now know that the variable “percent of free and reduced lunch” is the variable that is significant, so I fitted a model using just this variable. The results are below:

Table 2.

Regression Analysis: mean_Reading versus % of Free and reduced Lunch						
The regression equation is mean_Reading = 856 - 41.8 % of Free and reduced Lunch						
Predictor		Coef	SE Coef	T	P	VIF
Constant		855.586	1.033	828.63	0.000	
% of Free and reduced Lunch		-41.785	1.917	-21.79	0.000	1.000
S = 4.71419 R-Sq = 88.5% R-Sq(adj) = 88.3%						
Analysis of Variance						
Source	DF	SS	MS	F	P	
Regression	1	10554	10554	474.89	0.000	
Residual Error	62	1378	22			
Total	63	11932				

The model fitted with “average scaled reading score” as a response and “percent of free and reduced lunch” as a predictor is statistically significant. In the variance analysis table the P-value is smaller than 0.05. The value of R-Squared is very good; 88.3 percent of the variability in students scaled reading scores is explained by the variable “percent of free and reduced lunch”. Below there is a plot relating both variables:

Figure 3. Free and reduced lunch percentage and mean reading scores



Looking at the scatter plot one can see how clear the relationship between “average scaled reading” and “percent of free and reduced lunch” is. When the percent of free and reduced lunch is high, the average scores are low. When the percent of free and reduced lunch is low the scores are high.

I performed the same analysis using the “average math scaled scores” as the response variable and the results are the same. First I fitted a model using two predictors: “average personal leave” and “percent of free lunch”. The results are below:

Table 3. Mean math score / free and reduced lunch percentage / mean personal leave

Regression Analysis: mean_Math versus % of Free and red, mean_personalLea						
The regression equation is mean_Math = 861 - 57.1 % of Free and reduced Lunch - 0.442 mean_personalLeave						
Predictor		Coef	SE Coef	T	P	VIF
Constant		860.924	3.200	269.02	0.000	
% of Free and reduced Lunch		-57.146	3.593	-15.91	0.000	1.004
mean_personalLeave		-0.4417	0.2598	-1.70	0.094	1.004
S = 8.81571 R-Sq = 81.0% R-Sq(adj) = 80.4%						
Analysis of Variance						
Source	DF	SS	MS	F	P	
Regression	2	20230	10115	130.15	0.000	
Residual Error	61	4741	78			
Total	63	24971				

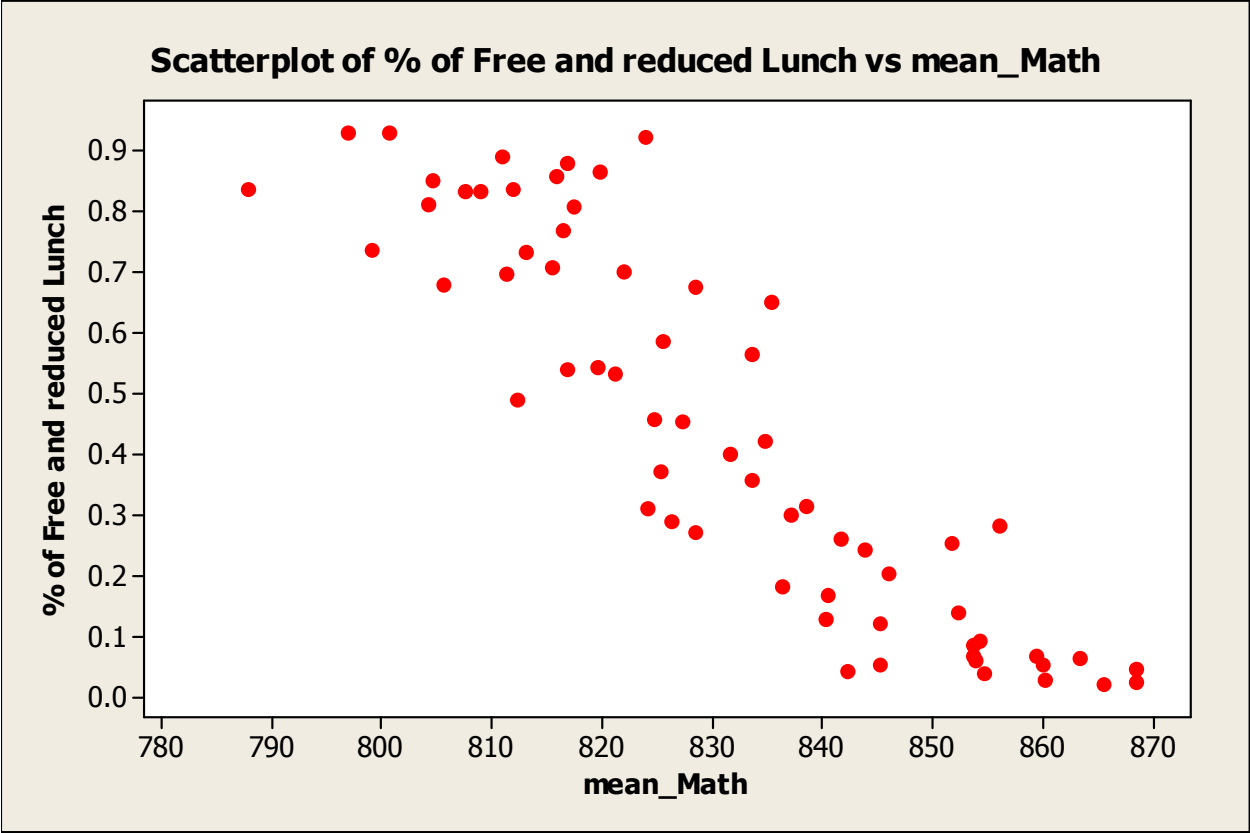
After I discarded the variable “average personal leave” and fitted the model using just the variable “percent of free/reduced lunch”, I obtained the following results:

Table 4. Mean math score / Free and reduced lunch percentage

Regression Analysis: mean_Math versus % of Free and reduced Lunch						
The regression equation is mean_Math = 857 - 57.5 % of Free and reduced Lunch						
Predictor		Coef	SE Coef	T	P	VIF
Constant		856.586	1.960	437.02	0.000	
% of Free and reduced Lunch		-57.529	3.640	-15.81	0.000	1.000

S = 8.94909 R-Sq = 80.1% R-Sq(adj) = 79.8%					
Analysis of Variance					
Source	DF	SS	MS	F	P
Regression	1	20006	20006	249.80	0.000
Residual Error	62	4965	80		
Total	63	24971			

Figure 5. Free and reduced lunch percentage and mean math score



One can see a clear linear relationship between “percentage of free and reduced lunch” and “average math scaled scores”.

Conclusion

Based on my research data, I can conclude that there is a statistically significant, although weak, relationship between student math scores and teacher absences; however, I am not able to conclude the same for the reading scores. A possible explanation for this is that attention to reading skills is a focus of learning beginning in pre-school and those skills begin to develop much earlier. The foundation for reading is set by the time the student is in second grade; more research is needed in this area. The focus on math skills begins in the third grade, so an absent third-grade teacher would have more of an impact on the learning of math skills. Students are also exposed to reading and language arts concepts outside of school, though math concepts are usually experienced in the school. The data also shows that there is a statistically significant effect on student scores in reading and math when compared with the percentage of students receiving free and/or reduced lunch at their school. This data shows that the schools that are considered low socioeconomic schools have statistically significantly lower scores on math and reading on the CRCT test.

There is existing research that shows that poor teacher attendance rates can affect student performance in the classroom, and my research shows that this is the case with student performance on the math section of the CRCT. I found that Cobb teachers miss on average approximately 14 days per school year from the classroom, with an average of 10 days for sick or personal leave. As this is a high number of absences, steps need to be taken to reduce these numbers. Socioeconomic status is also a predictive factor of student success, with students in the low socioeconomic schools scoring lower on the CRCT. We have to ask ourselves why that is the case. The amount of support children receive from

their parents is one important variable. When a family is struggling financially and under a lot of stress, it is more difficult for those parents to provide needed support to their children. The attendance of the student themselves is also a factor, as well as the higher absenteeism of their teachers. The 2008/2009 CRCT results released on July 13, 2009 show that district-wide, more than 93 percent of all Cobb students met or exceeded standards in English language arts, and 85 percent of students met or exceeded standards in math (www.cobbk12.org).

As this is not a common issue that is currently discussed among human resources professionals in my organization, I hope to use my research data to open that dialogue. My interest in pursuing this issue further is to make the Superintendent and the Board of Education aware of my findings regarding the impact on student performance of teacher absenteeism, in the hope that the school district will develop policies and strategies to deal with the problem. It will also be important to draw attention to the issue and demonstrate to students and parents that the Human Resources Department is concerned about student and teacher performance. The results of this data collection and analysis will assist the district in focusing necessary attention on this issue; will have an impact on district attendance policies and procedures and on the type of attendance policy enforcement procedures considered. The results of this research will assist the administration of the Cobb County School District in making decisions on future policy implementation.

Recommendation

All faculty and staff should be made aware of the content and results of this study and how serious the impact teacher absenteeism has, particularly on students who are already deprived in other ways and need the full attention and focus of their teacher.

Cobb principals should require all teachers to make personal contact with them or an assistant administrator when they will be absent. Research has shown that the most effective way to reduce teacher absenteeism is to implement a policy requiring that teachers speak directly to the school principal when they are calling in sick (Keller, 2008; Pennsylvania School Board Association, 1978). Though I recognize that this will place an added burden on the school principal, the effectiveness of the method will eventually reduce the work placed on the principals when their teacher attendance improves. This will eventually lead to a reduction in the financial expenditure on substitute teachers, allowing more money for the principal to use on other important programs or supplies as an incentive for high attendance. If a principal does not require a teacher to make contact with them when they are out, it is unlikely that they will be aware when a teacher is absent on a consistent basis.

Principals need to explain attendance expectations to faculty and staff at the beginning of each school year and then follow up to monitor attendance. School districts should also regularly gather attendance data and monitor the leave usage of their employees.

I also recommend that the District look at implementing incentive programs to encourage and reward good attendance, such as monetary bonus' for teachers who have perfect attendance, or those who do not use more than their three allotted personal days

each year. Individual schools should recognize employees with good attendance each year and offer some type of gift certificate or other reward. Another suggestion included in the research I reviewed was to put teacher attendance data on student report cards, as done by the New York City Schools whose teachers miss an average of 11 days annually (*Chicago Tribune*, 2006). This idea would not be politically popular with the teacher's organizations and resistance would undoubtedly be strong, however this is an option to consider if other efforts to improve attendance are unsuccessful.

As noted, more research needs to be done to determine why teacher absences tend to affect student math scores more than reading scores.

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