

A CORRELATIONAL STUDY OF TEACHER ABSENCES AND
STUDENT TEST SCORES IN URBAN AND SUBURBAN
ENVIRONMENTS


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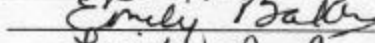
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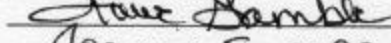
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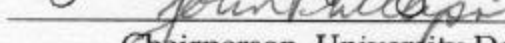












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Abstract:

This project was completed to determine if there was a correlation between teacher absences and low student test scores, as well as if there was a demographical location in which these absences and low achievement were most likely to occur. The participants of the project included urban and suburban teachers and principals from the Hamilton County, Tennessee, public school system. During interviews with principals, a control group of teachers and an experimental group of teachers was established for each school. Teachers were grouped based upon whether the number of absences from the 1999-2000 school year, prior to April 1, 2000, were determined to be excessive and capricious or not. After obtaining the standardized test scores for the class of each teacher selected, a statistical analysis comparing test scores to the number of teachers' absences was completed. Urban schools were compared with urban schools, and suburban schools were compared with suburban schools. All results were determined to be statistically insignificant. The implications of these findings were that many factors lead to low student test scores. In this study, teacher absenteeism did not seem to be a correlating factor. Various resources cited other factors as correlating with

low student achievement. These factors included the following: student mobility, instructional technology, school climate, demographics, and socio-economic factors among others. Teacher absenteeism was not listed as one of the contributing factors in these studies.

Introduction:

Research outlines various components of effective instruction and best practice in teaching. If the teacher is not regularly attending class, it seems that the lack of these components of good teaching would affect students' mastery of material. The Rutter study found that teacher-student interactions, incentives, and rewards could affect student outcomes (Achievement Test). With previous research pointing to the various characteristics of good classroom teaching leading to improvement of students' standardized test scores, it follows that a teacher who was regularly present in the classroom to implement these strategies would also have had students who achieved better results as compared to teachers who were regularly absent.

This project was designed to statistically compare teachers who had fewer than four absences during the 1999 through 2000 school year to

those who had more than seven absences using the respective standardized test scores of their students. It was designed so that teachers from different areas of the county will be considered in addition to considering teachers from similar demographic areas. It was my belief that the teacher's regular presence in the classroom would positively affect student learning. Thus, capricious teacher absences would correlate with low student test scores in both urban and suburban environments.

Many teachers across the country are assessed for effectiveness of instruction by student test scores. This study specifically considered absences effects on student test scores. Only the absences prior to April first for the 1999 through 2000 school year were considered in the analysis for teacher absence rates. This was because the Terra Nova exams, Tennessee's selected standardized tests, were given early in April 2000. It was therefore assumed that absences that occurred after the exam dates would not have affected the outcome of the student scores and were not necessary data in the study. While there were other ways of measuring student educational outcomes, such as Performance Task Assessments, the statistical comparison of the absences to the standardized test scores was the only efficient and statistically reliable method of making such a

determination. While the study was empirical, due to the use of empirical data from the Terra Nova tests, it might only be applicable to these specific situations in Hamilton County, Tennessee.

In completing this project, two groups of teachers were compared; one group was determined by their principals to have had non-capricious absence rates in the 1999 through 2000 school year, while the other was determined to have had capricious absence rates. The principals thought that absences in excess of five days were capricious because five days make one whole week of school. The rates used for the control group, those with non-capricious absence rates, were teachers who had missed fewer than four days during the year. The rates used for the experimental group, those with capricious absence rates, were teachers who had missed more than seven days during the year. Most of the principals who were interviewed thought it logical that teachers in both urban and suburban environments, who had high absence rates, would also have had students with lower test scores.

Background:

In Tennessee, the Terra Nova / Tennessee Comprehensive Assessment Program (TCAP) published by CTB McGraw-Hill, is used to assess student knowledge. According to the Evaluation and Assessment Division of the Tennessee Department of Education, the purpose of the Terra Nova / TCAP exams is to “provide an accurate measure of academic basic skills in reading, vocabulary, language, language mechanics, mathematics, computation, science, social studies, spelling, and word analysis.” (Achievement Test). The Terra Nova is a section of the TCAP designed to assess higher order thinking skills and thought processes. (Achievement Test). It replaces the old sections A-H of the TCAP exam. (About Terra Nova). In Tennessee, students in the third grade through the eighth grade are required to take the tests (About Terra Nova). Students may be tested before the third grade, depending on the school district. Hamilton County decided that the principals at each school would select the grade during which testing begins.

The Terra Nova is a norm-referenced exam which compares each student to a national pool of students. The pool is designed to represent a cross-section of the population across the country. Scores are curved to show a national average, and student percentile ranks on the tests reflect

placement on this national curve. The test is renormed approximately every seven years. The Terra Nova also has Objective Performance Indicators that are designed to assess students according to criteria (objectives). These criteria, according to the Tennessee Department of Education, align closely with Tennessee curricular standards.

Review of Literature:

There was very little research pertaining to student test scores and teacher absences; the research that was available seemed contradictory. Most of the research focused on other factors that may have affected student scores such as student absences, demographics and mobility, and school environment. Much of the research focused on problems with substitute teachers and ways to improve absence rates.

Previous similar studies related to student achievement and teacher absences have had varying responses. For example, Norton's study found the teacher absence rates to be highest in schools with lower achievement, economically disadvantaged students, and minority students (Norton, 95). Norton generalized that urban schools and large school districts are more likely to have higher rates of absenteeism for their teachers. According to

Norton, several other studies found lower test scores associated with teacher absences. One of these studies is the Summers and Raivetz study of 1982, which found that low fourth grade reading scores correlated with higher rates of teacher absences. Likewise, O'Brien's study found a correlation between teacher absenteeism and student achievement. However, other studies contradict these findings. In 1983, Ziomek and Schoenberger did not find a correlation between teacher absences and student test scores (Ziomek, 232). The same conclusion was reached in a 1991 study by Madden (Norton, 95), and again in 1991 in Ehrenberg's study (Ehrenberg, 72). A more recent study by Borland and Howsen in 1998 did find a positive correlation between attendance and achievement, but the impact was described as "insignificant" (Lamdin, 198).

Several studies on student achievement have considered student absences in determining factors that lead to low test scores. Researchers found that student attendance at school was correlated with good test scores. "Underachievers [students] averaged a much higher number of both absences and tardiness than did achievers" (Peterson, 399). If the student must be present in order to learn the necessary skills and information for the tests, it seems fitting that the teacher needs to be

present to instruct. A report of a study conducted in New Orleans Public Schools shows that students who were absent less frequently performed better on the California Achievement Tests (New Orleans, ERIC).

Students who were absent more than sixteen days saw a decrease in scores ranging from four to seven points. If student achievement was affected by the student's own absence from school, it seems likely that student achievement would be affected by the lack of instruction when a teacher was regularly absent. According to Stephen Jacobson in "Attendance Incentives and Teacher Absenteeism," "the impacts of absence (both student and teacher) considered at the classroom (or group) level, offer considerable research promise, because absences create collective patterns which in themselves may have important influences on the level, nature, and distribution of learning outcomes."

There was an abundance of research on student characteristics that correlated with low test scores. Some of the most commonly cited factors included students living in poverty, high student mobility, and Limited-English Proficiency students. For example, Norton found that students who were living in poverty had lower test scores. Cynthia Esposito found the same result in her study, and in addition noted that "aspects of school

climate affect children's school achievement" (Esposito, 365). A study on the effectiveness of first grade teachers in literacy instruction found classroom environment to be a significant determining factor in achievement (Marton-McDonald, 101). A United States General Accounting Office Report from 1994 cited a similar result, as well: "students with high mobility are more likely to be low income, inner-city, migrant, or children with Limited-English-Proficiency" (Wright, 347). Alexandar, Entwistle, and Dariber in 1996 studied students in Baltimore, Maryland, and found that "by the end of fifth grade, mobile students had lower test scores" (Wright, 347).

There were also some that argued that student factors such as socio-economic status or money spent per pupil did not affect achievement nearly as much as the teacher. Sanders, developer of Tennessee's Value Added Assessment system disagreed with results of research linking student achievement to circumstantial factors such as socio-economics. Sanders has claimed that the reason children learn or do not learn is the effectiveness of the classroom teacher. His studies have found the "overwhelming importance of the classroom teacher in determining academic growth" (Sanders).

The problem with teacher absenteeism is further complicated in that for each day a classroom teacher is not present, a substitute teacher must be hired to supervise the class. Substitute teachers are often not certified and may lack the expertise to teach some subjects and children. In every state except Iowa, substitute teachers need no teaching certification; it was found that Iowa does require substitutes to be certified teachers. In twenty-eight states, anyone who is 18 or older with a high school diploma or equivalent diploma could be hired to substitute. Seventy-seven percent of school districts have not required training for substitute teachers (Elizabeth). The issue with substitutes has extended beyond lack of training to the type of work left for students to complete while the regular classroom teacher was absent. Woods and Montagno (1997) described the work as “busywork.” To further complicate matters, there has been a shortage of substitute teachers. Large school districts such as Chicago Public Schools have claimed they have not had enough substitutes to fill all of the teacherless classes. For example, they have been averaging 2200 substitute teachers per day. Their substitute pool has only been 3000. According to school officials, they have needed at least

10,000 substitutes in order to fill every opening (McGinn, 42).

Chattanooga's situation has been less drastic, but similar.

In considering research on possible explanations for student test scores, it seemed that there were many factors that may have correlated with test scores. Teacher absences in addition to these other factors, it seemed, would compound the negative effects on achievement.

Method:

Participants:

The participants of this study included urban teachers, numbered one through twenty-two, suburban teachers, numbered one through nineteen, and principals numbered one through five. All of the participants were employed by Hamilton County, Tennessee, as either teachers or administrators during the 1999-2000 school year. The participating schools included three urban schools and two suburban schools from different areas in Hamilton County, Tennessee. The five principals from these schools participated in interviews regarding the teacher absences. Ten urban teachers were assigned to the control group and twelve urban teachers were assigned to the experimental group.

Twelve suburban teachers were assigned to the control group and seven suburban teachers were assigned to the experimental group. Only teachers who had standardized Terra Nova scores were used. No teachers below second grade or above fifth grade were used in this study, even if the scores were available from the schools.

Materials:

The materials used to divide the teachers into groups were absentee records, which included the date of the absence, the reason for the absence during that school year, and whether a substitute was hired. The information listed the dates of absences and the reasons for the absences, in chronological order beginning in August, 1999. From these lists, a tally was made of both the types of absences and the total number of absences per teacher for each school. The other data used was information from Terra Nova scores. These were obtained through Hamilton County. The score reports were organized according to school, grade, teacher, and objectives assessed. For each objective, a total raw score of each teacher's 1999-2000 class scores was shown. Not all objectives were used in the study. The objectives for the statistical comparison were selected as either

part of the reading/language objectives or part of the mathematics objectives. The objectives for subjects such as social studies and science were not used because they were not consistent across all grade levels. For example, social studies in lower grades consists of learning about communities, while social studies in upper elementary grades focuses on Tennessee history or American history. For subjects such as social studies with differing objectives, the results are not comparable.

Procedure:

Permission to complete this study was obtained from Hamilton County, the principals of the participating schools, and the University of Tennessee at Chattanooga Human Subjects Research Committee. A literature review was completed to identify results of other similar experiments, as well as other factors that may correlate with low test scores. Literature was also considered regarding teacher absences, its effect on classroom instruction, and possible causes and solutions for absences. Absentee records were obtained from Mr. Fred Carr, Assistant Superintendent for Technology and Support for Hamilton County Schools. The records were sorted and tallied according to teacher, by type

of absence. Types of absences included the following: personal illness, family illness, bereavement, personal days, professional development, and miscellaneous absences. As in the Woods and Montagno (1997) study, an absence was counted as an absence regardless of the reason. Although there are legitimate reasons for an employee to miss work, the reason would not have altered the outcome of the absence (Achievement Test). Teachers who were on leaves of absence for long-term illness or maternity leave were not included in the original packets of information from Hamilton County, and therefore are not reflected on the lists. Meetings with principals were then held to determine teachers' eligibilities for inclusion in one of the groups. Interviews were conducted to determine the grade level each teacher taught during the year, as well as to establish a figure of capricious absences. The principals agreed that more than five days absences are capricious because five days constitute one week of school. Less than five days, they agreed were not capricious. Principals' knowledge of faculty as well as information regarding teacher absences is essential in understanding outcomes of the study. Principals' interviews have been used in other studies, such as the Woods-Mongtagno (1997) study, for similar purposes. As a result of these meetings, several teachers

were selected from each school to participate in the control and experimental groups. Test score data was obtained from Hamilton County for the selected teachers. All identifying information was then removed from the study and was replaced by generic numbers. Absence rates and test score data were then statistically compared in a t-chart. Although r-charts are typically used to determine correlation, r-charts require three variables in question. Testing for two factors, absence rates and demographics, necessitates the use of the t-chart. At the time of the conclusion of the research, principals' interviews were considered in determining possible reasons for the outcome of the results.

The data was sorted several different ways for the analysis. First, the data for the control group was then compared statistically to the data from the experimental group. The groups were again compared after they were resorted into suburban control and experimental groups and urban control and experimental groups. This was done to determine if there was a correlation within only one demographic area versus the whole county. Suburban and urban teachers' raw scores were not compared against each other. In all cases the results were found to be statistically insignificant.

Principals' interviews were then important in understanding how this outcome is possible.

Results:

As previously indicated, the purpose for this study was to determine if teacher absences correlated with low student achievement. Scores from reading/language and mathematics objectives were considered in the analysis. A t-test, or causal-comparative study, was run instead of an r-test for correlation in the statistical analysis of the data. This was necessary as there were only two conditions for which the statistical assessment was being completed, absence rate and demographic location. The t-test is effective because it determines if two factors are present simultaneously, in this case absences and demographics in light of test scores. The alpha level used in the study is five percent. In order for the correlation to be statistically significant, the significance level must be less than five percent. A ninety-five percent confidence level was used throughout the study. This study was completed using information from the 1999-2000 school year. The null hypothesis in the study, teacher

absences in urban and suburban environments will not correlate with student test scores, was not disproved. This is evident when considering the significance levels in the tables.

Table 1 shows the sum of student scores for each subject category per teacher as well as the type of group to which the teachers were assigned.

Table 1: Teachers' Raw Scores and Absence Categories

<u>Teacher</u>	<u>Reading</u>	<u>Vocabulary</u>	<u>Language</u>	<u>Language Mechanics</u>	<u>Mathematics</u>	<u>Word Analysis</u>	<u>Capriciously Absent?</u>
UT #1	148	145	96	136	528	151	Yes
UT #2	43	47	16	32	118	NS	Yes
UT #3	33	11	50	47	173	NS	Yes
UT #4	145	44	166	89	340	167	Yes
UT #5	62	75	63	67	379	84	No
UT #6	45	70	32	19	174	NS	No
UT #7	30	33	10	38	192	NS	No
UT #8	75	30	45	30	135	NS	No
UT #9	67	72	43	25	157	NS	Yes
UT #10	55	51	40	45	135	60	Yes
UT #11	30	14	5	15	73	NS	Yes
UT #12	138	47	88	61	130	130	Yes
UT #13	94	100	16	78	212	100	No
UT #14	96	54	88	74	118	89	No
UT #15	25	38	15	29	101	NS	No
UT #16	74	37	26	42	124	NS	Yes
UT #17	40	60	127	86	327	134	Yes
UT #18	89	100	85	58	237	NS	Yes
UT #19	216	158	108	83	601	159	Yes
UT #20	77	35	89	30	329	147	No
UT #21	172	135	57	85	502	158	No

UT #22	122	52	69	48	221	NS	No
ST #1	327	242	205	158	599	189	Yes
ST #2	327	273	253	167	680	286	Yes
ST #3	343	182	292	187	683	313	Yes
ST #4	351	221	263	146	650	NS	No
ST #5	311	169	194	163	668	216	No
ST #6	356	220	196	164	696	NS	No
ST #7	288	217	209	142	639	NS	No
ST #8	272	215	228	157	619	NS	No
ST #9	250	141	125	138	589	NS	Yes
ST #10	231	109	113	92	532	NS	Yes
ST #11	221	105	231	121	485	279	Yes
ST #12	290	145	245	150	645	330	Yes
ST #13	196	188	137	141	586	NS	No
ST #14	176	184	84	146	498	NS	No
ST #15	254	108	173	119	604	NS	No
ST #16	152	160	148	160	520	NS	No
ST #17	315	157	276	162	718	343	No
ST #18	227	105	109	100	552	NS	No
ST #19	285	126	210	131	540	301	No

Table 2: Capricious v. Non-Capricious (Urban and Suburban)

	Capricious	N	Mean	Standard Deviation
Reading	1.00 Yes	19	161.42	110.61
	2.00 No	22	180.95	109.91
Vocabulary	1.00 Yes	19	104.37	73.97
	2.00 No	22	122.36	67.88
Language	1.00 Yes	19	121.79	87.46
	2.00 No	22	123.23	83.92
Language Mechanics	1.00 Yes	19	91.16	52.83
	2.00 No	22	101.32	52.62
Mathematics	1.00 Yes	19	376.63	225.67
	2.00 No	22	438.77	213.22
Word Analysis	1.00 Yes	11	199.82	88.01
	2.00 No	8	179.75	98.54

Table 2 is descriptive data that explains the raw data in terms of two groups, capriciously absent teachers, and non-capriciously absent teachers.

Table 3 is the t-test for the Equality of Means for the capricious versus non-capricious teachers in both urban and suburban environments. The degrees of freedom for Table 3 are thirty-nine for all objectives except the Word Analysis section. This section only had seventeen degrees of freedom because only lower grades were assessed on Word Analysis

skills, which results in fewer teachers factoring into the calculations. All results were statistically insignificant.

Table 3: Capricious v. Non-Capricious (Urban and Suburban)

	t	df	T-Test for Equality of Means Mean Difference*
Reading	-0.566	39	-19.53
Vocabulary	-0.812	39	-18
Language	-0.054	39	-1.44
Language Mechanics	-0.615	39	-10.16
Mathematics	-0.906	39	-62.14
Word Analysis	0.467	17	20.07

*No groups differ significantly.

Table 4 is descriptive data which explains the raw data in terms of two groups in an urban demographical location, teachers who are capriciously absent, and teachers who are not capriciously absent.

Table 4: Capricious Urban v. Non-Capricious Urban

	Capricious	N	Mean	Standard Deviation
Reading	1.00 Yes	12	89.83	58.88
	2.00 No	10	79.8	44.46
Vocabulary	1.00 Yes	12	65.5	46.64
	2.00 No	10	62.2	33.89
Language	1.00 Yes	12	70.83	48.83
	2.00 No	10	48.4	29.53
Language Mechanics	1.00 Yes	12	59.92	33.82
	2.00 No	10	49.8	24.09
Mathematics	1.00 Yes	12	254.25	170.89
	2.00 No	10	236.3	128.58
Word Analysis	1.00 Yes	6	133.5	38.71
	2.00 No	5	115.6	34.4

Table 5 is the t-test for the Equality of Means in Capricious Urban teachers compared to Non-Capricious Urban teachers. The degrees of freedom reflect using only the urban teachers in the test. Here again, the test results are statistically insignificant.

Table 5: Capricious Urban v. Non-Capricious Urban

	T-Test for Equality of Means		Mean Difference
	t	df	
Reading	0.443	20	10.03
Vocabulary	0.186	20	3.3
Language	1.269	20	22.43
Language Mechanics	0.792	20	10.12
Mathematics	0.136	20	8.95
Word Analysis	0.802	9	17.9

Table 6 is descriptive data which explains the raw data in terms of two groups in a suburban demographical location, teachers who were capriciously absent, and teachers who were not capriciously absent.

Table 6: Capricious Suburban v. Non-Capricious Suburban

	Capricious	N	Mean	Standard Deviation
Reading	1.00 Yes	7	284.14	50.25
	2.00 No	12	265.25	66.25
Vocabulary	1.00 Yes	7	171	64.99
	2.00 No	12	172.5	42.7
Language	1.00 Yes	7	209.14	66.95
	2.00 No	12	185.58	58.31
Language Mechanics	1.00 Yes	7	144.71	31.29
	2.00 No	12	144.25	19.68
Mathematics	1.00 Yes	7	601.86	74.45
	2.00 No	12	607.5	70.32
Word Analysis	1.00 Yes	5	279.4	54.56
	2.00 No	3	286.67	64.7

Table 7 shows the results of the t-test run for the Equality of Means in comparing capricious suburban teachers to non-capricious suburban teachers. The degrees of freedom reflect using only the suburban teachers data in the test. Like the results of the other tests, these are statistically insignificant.

Table 7: Capricious Suburban v. Non-Capricious Suburban

	T	Df	Mean Difference*
Reading	0.65	17	18.89
Vocabulary	-0.061	17	-1.5
Language	0.805	17	23.56
Language Mechanics	0.04	17	0.46
Mathematics	-0.165	17	-5.64
Word Analysis	-0.171	6	-7.27

*No groups differ significantly.

Discussion:

Teacher absenteeism does not correlate with student test scores in the study of Hamilton County, Tennessee. According to principal interviews and various literature sources, there are several possible explanations for this result. These may include teacher job satisfaction,

experience in education, stress from outside work, low morale, dedication to the field, and school climate. It is possible that the quality of the teacher does not correlate with the number of absences for each teacher. Likewise, it is possible that the quality of the teacher does not correlate with student achievement scores. There are many factors that can be correlated with low test scores, and many that are attributed to high test scores. In this study, absenteeism is not a correlating factor.

When the teachers are separated into groups of lower test scores and higher test scores, a few patterns emerge. For example, in two schools, teachers with higher test scores were teaching lower elementary grades. Teachers with lower test scores in these schools taught upper elementary grades. Also interesting is that in three elementary schools, most of the teachers with higher test scores were more experienced teachers. Generally, the teachers with lower test scores were not yet tenured. The experience aligns closely with the predictions of the principals and Sanders' research that the more experienced teachers would have better achievement scores (Sanders). Several principals thought that younger teachers would have both higher absence rates and lower test scores. One of these principals said that young teachers "catch

everything that goes around” because they have not yet built up a resistance to the childhood sicknesses that regularly circulate in a school. One principal suggested that younger teachers might have lower test scores because they are not familiar with the tests.

A principal suggested that the reason for absences of many teachers is stress, both from work and personal matters. According to Czubaj’s (1996) article on maintaining teacher motivation students of teachers who reported less job stress scored higher on achievement tests than students of teachers who reported more job stress. One principal also stated that the leading prescribed medication for teachers is *Prylosec*, which treats stomach ulcers, with *Prozac* as a close second. Teachers are being held accountable for student learning in the classrooms at an increasing rate. This pressure can produce job stress in addition to the usual concern for the well being and educational growth of the children under the teacher’s care. Likewise, stress from personal matters may affect teachers in the classroom. Several teachers from all five schools had experienced stress from sources other than their jobs. Many were completing Masters degree coursework; a few had medical issues; several had new babies or were

married during the school year. Four teachers had experienced loss of parents or spouse's parents during the year.

When asked if they thought absence rates would be higher in urban or in suburban environments, the answers were mixed, and usually favored the opposite demographic location. One urban principal suggested that absence rates would be better in suburban schools due to parent involvement, higher morale, and increased job satisfaction. One suburban principal thought urban schools would have the lowest absence rates because their younger teachers are excited to have classrooms and children to teach, where their more experienced teachers display unusual dedication to education and the betterment of their students' lives. This principal also noted that suburban schools get substitutes more easily, so the teachers do not worry as much about calling in to work with late notice.

Some of the teachers with stronger test scores fit into the capricious absence category. While the nature of the absence had no effect on the placement in the group, in light of the results, the reason is interesting to consider. For example, some of these teachers had missed several days for professional development activities. Perhaps it is the teachers such as

these who are interested in keeping up with their field, who are such effective teachers when they are in the classroom, that student learning is not negatively impacted by their absences.

Some of the teachers with lower test scores are described by their principals as being very effective in the classroom. Several are at the top of their schools in Tennessee Value Added Assessment Scores, or gains scores. Gains scores measure student achievement over the course of a year, from one Terra Nova to the next. The scores are reflected in percentages; if a student has one hundred percent gains, his scores have improved by one whole grade level since the previous year. According to the principals, there is usually very little to no correlation between value-added scores and raw test score data.

Suggestions for Future Research:

Due to the contradiction of much of the research on teacher absenteeism and student test scores, more research over larger periods of time and with more teachers may be informative. It would also be interesting to see if student gains scores correlated with teacher absenteeism. As gains scores often do not correlate with raw test score

data, it seems that it could be possible for the tests to have different results.

The results might also differ if a larger sample size, including more teachers with higher absence rates (20 or more absences), could be used in a similar test. In this experiment, the average number of missed days for the capriciously absent teachers was only 12.15, and the average for the non-capriciously absent was only 2.09. This limitation may have affected the results of this study.

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