THE RELATIONSHIP OF STUDENT MATHEMATICS SCORES ON THE SCHOLASTIC APTITUDE TEST TO TEACHER EFFECTIVENESS AS MEASURED BY THE TEXAS TEACHER APPRAISAL SYSTEM

DISSERTATION

Presented to the Graduate Council of the University of North Texas in Partial Fulfillment of the Requirements For the Degree of DOCTOR OF PHILOSOPHY

By

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Abstract

Clingman, Elizabeth Ann, The Relationship of Student Mathematics Scores on the Scholastic Aptitude Test to Teacher Effectiveness as Measured by the Texas Teacher Appraisal System. Doctor of Philosophy (Secondary Education), December, 1988, 102 pp., 8 tables, bibliography, 54 titles.

The purposes of this study were (1) to determine the scores on the quantitative portion of the SAT for 110 students and these students' math teachers' ratings on the TTAS, (2) to determine the nature of the relationship of the students' SAT scores to their teachers' TTAS ratings, and (3) to determine the nature of the relationship of the students' SAT scores to their sex. It was hypothesized that (1) there would be no significant relationship between a student's math score as measured by the quantitative portion of the SAT and the effectiveness of the student's math teacher as measured by the TTAS, and (2) there would be no significant relationship between a student's math score as measured by the quantitative portion of the SAT and the student's sex.

The 110 subjects (60 males and 50 females) in this study took the quantitative portion of the SAT...
during the 1986-87 school year. This sample was drawn from a large suburban high school in the North Texas area. The effectiveness of the math teachers who taught the 110 students was measured by the Texas Teachers Appraisal System (TTAS). The statistical analyses indicated that (1) there was no significant relationship between a higher SAT score and a math teacher's higher TTAS rating and (2) there was no significant relationship between male and female SAT scores. Recommendations for future research include: (1) does the TTAS actually measure teacher effectiveness, (2) do appraisers in Texas follow state mandated training procedures, (3) does the quantitative portion of the SAT contain sexually biased items, (4) does the SAT actually predict student ability, (5) do teachers respond in like manner to male and female students, (6) does the high school curriculum tend to favor one sex more than the other.
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CHAPTER I

INTRODUCTION

The National Commission on Excellence in Education published its report, "A Nation at Risk" in 1983. This report brought education and the need for reform to the public's attention.

When the National Commission on Excellence in Education called for education reform in "A Nation at Risk" it fell in at the head of a parade that had already begun to take shape. Just as Sputnik became a symbol around which the math and science reformers of the late fifties rallied, the report of the National Commission and the dozens or so other reports that followed transformed 1983 into a watershed year for American education. It was the year we discovered the term mediocrity and the national reports were soon followed by hundreds of reports from state-level task forces and blue-ribbon commissions. (Pipho, 1986)

School reform has not diminished since the early 1980s. Despite the economic problems, governors continue to speak out for reform programs and even add
new reforms.

In recent years, governors and even legislators in a number of states have made education the centerpiece of their economic agendas, and this fact has not gone unnoticed by policy makers in other states. Standing up for education has become a political asset, not an election year liability. (Pipho, 1987)

With the national reform movement, "the most carefully watched barometer of educational achievement was, for better or worse, the Scholastic Aptitude Test (SAT)" (Doyle & Hartle, 1985).

Since the public schools have looked to tests like the SAT to measure achievement prior to the 1980s' reform movement, it is appropriate to again use these instruments to see if the reforms have improved the effectiveness of the teachers and the schools. Have the school reforms such as effective teaching practices, teacher competency testing, teacher appraisal systems, and increased graduation requirements actually made a difference in the quality of the schools? Educational reform must be evaluated along with the teachers, the administrators, and the schools to see if these changes have made a significant difference in the overall quality of the schools.
The parents and the public are demanding accountability of the school systems. The method most often looked at to measure the effectiveness of the schools is student test scores since "excellence is associated more with quantitative than qualitative factors" (Duke, 1985). The test often looked to is the SAT, since many students take it and it is well known throughout the United States.

The SAT is familiar to the public. Since many colleges and universities use this test as one of the conditions for admission, parents and students place a high value on it. "In 1974 the public learned that the average SAT scores had been declining for the last ten years. Complaints came that the quality of the public school systems had declined" (Lazarus, 1981). The quality of the public schools is apparently in need of improvement.

...it's sobering to note that America's public schools graduate 700,000 functionally illiterate kids every year - and that 700,000 more drop out. Four out of five young adults in a recent survey couldn't summarize the main point of a newspaper article, read a bus schedule, or figure their change from a restaurant bill. (Kearns, 1988)

As a part of the reform movement of the 1980s,
the concept of teacher accountability has been brought to the forefront. Parents, community leaders, and business leaders want to know how effective the teachers are in their communities.

...public education has put this country at a terrible competitive disadvantage. The American workforce is running out of qualified people. If current demographic and economic trends continue, American business will have to hire a million new workers a year who can’t read, write, or count. Teaching them how — and absorbing the lost productivity while they’re learning — will cost industry $25 billion a year for as long as it takes. And nobody I know can say how long that will be. Teaching new workers basic skills is doing the schools’ product-recall work for them. (Kearns, 1988)

A great deal of money is spent annually on the educational system in the United States.

Public education consumes nearly 7% of our Gross National Product. Its expenditures have doubled or tripled in every postwar decade, even when enrollments declined. I can’t think of any other single sector of American society that has absorbed more money by serving fewer people with steadily declining service. (Kearns, 1988)
The public does and should demand a better product considering the vast amount of money being consumed by our school systems.

The method the public looks to for determining school effectiveness is test scores, especially the SAT. Generally speaking, the public tends to believe the most effective teachers produce the most effective schools which in turn produce the highest student SAT scores.

There is little research which looks at SAT scores as they relate to the effectiveness of schools. It is important to determine the relationship of the SAT scores to the public schools' effectiveness. The quality of our teachers and schools will certainly impact America's future

Statement of the Problem

The problem of this study was to determine what the nature of the relationship is between a student's math score as measured by the quantitative portion of the SAT and the effectiveness of the student's math teachers as measured by the Texas Teacher Appraisal System (TTAS).

Purposes of the Study

One purpose of this study was to determine the scores on the quantitative portion of the SAT for 110 students and these students' math teachers' ratings on
the TTAS. The second purpose was to determine the nature of the relationship of the students' SAT scores to their teachers' TTAS ratings. The third purpose was to determine the nature of the relationship of the students' SAT scores to their sex.

Hypotheses

The following research hypotheses were tested.

1. There is no significant relationship between a student's math score as measured by the quantitative portion of the SAT and the effectiveness of the student's math teacher as measured by the TTAS.

2. There is no significant relationship between a student's math score as measured by the quantitative portion of the SAT and the student's sex.

Background and Significance of the Study

The SAT is an instrument which indicates what a student has mastered and what ability he has.

In the quality-conscious climate of the 1980s, typified by the strong language of "A Nation at Risk," a preoccupation with quantifying educational productivity has developed. As a result, the credibility of standardized tests as accurate and fair measures of the quality of education has risen. Criticism of the SAT and of similar tests has diminished. Indeed, when candidates hit the campaign trail in 1984, they
made much of the long decline in SAT scores. The politicians, at least, had accepted the SAT as the instrument for gauging educational effectiveness. (Steelman & Powell, 1985)

Parents, as well as people who have no children in schools, see articles and state-by-state listings of the SAT scores each year in local newspapers. "Former Secretary of Education, Terrel Bell, issued the 'school scoreboard' which listed SAT scores and a variety of other indicators by state" (Steelman & Powell, 1985). Some states actually have used the SAT scores in advertisements to attract new businesses to their state. "Test scores are more than apolitical measurements of how much students know; they are a powerful weapon in political debate at all levels" (Salganik, 1985). Is it any wonder that the public demands an increase in these scores?

The SAT, in 1926, was believed to be a test of "innate mental ability" (Dyer, 1987). If this is true, a student's performance could not be improved with coaching or tutoring sessions. However, recent research does show that a student's score can be improved with academic instruction or coaching.

The innate mental trait theory has long since been abandoned by the producers of the SAT and by most psychologists. These days 'scholastic
aptitude’ is usually regarded as a set of abilities that develop as a result of experiences in school, in the home, and elsewhere. (Dyer, 1987)

Since 1983 and the publication of "A Nation at Risk" the public has perceived that the schools were not as good as they once were. One reason for this perception is that the public learned in 1974 that the average SAT scores had been declining since 1964.

In an effort to help resolve this problem, The College Entrance Examination Board (CEEB) which is responsible for the SAT, appointed a blue ribbon panel to look into this matter. Former Secretary of Labor, Willard Wirt, chaired the committee. It included some of the best known names in American education and they published their report in 1977, "On Further Examination." (Lazarus, 1981)

The main thrust of this report was to point out that if the SAT, were, as its title suggests, truly an aptitude test, students’ scores should depend much more on their inherent aptitude than on their past education. This makes no sense. A student’s aptitude for college depends largely on success at earlier schooling along with other
factors like interests, goals, and motivation, none of which play a direct part in the SAT. If a student has not learned to read, chances are he will not get through his freshman year. Thus the SAT is both an achievement and an aptitude test. In fact, all educational tests measure some combination of achievement and aptitude.

(Lazarus, 1981)
The SAT, since it is a measure of both achievement and aptitude, does reflect what the schools are doing with the students and the public can look to tests for a measure of quality.

Why does the public look to test scores like the SAT to determine the quality of the school system? Traditionally it has been teacher judgment which determined if a child moved to the next grade or graduated from high school. Teachers were trusted but in the climate of perceived teacher incompetency and the feeling of inadequacy of the schools, parents demand proof of their child's qualifications for graduation. Test scores offered this proof, and the public, as well as teachers, looked to these test scores to restore confidence in the schools and to provide quality control.

Legislators viewed the use of test scores to assess learning as a way of freeing themselves
from involvement in decisions related to program operation; at the same time, they knew that using scores for this purpose would pressure educators to improve the schools and would produce evidence of improvement that the general public would find convincing. (Salganik, 1985)

Since the public school system relies on the public for support, educators were also happy to use test scores to justify promotion and graduation decisions to parents. Test scores provided an objective means to show parents exactly how their children were achieving.

Between 1981 and 1984 the proportion of respondents who gave the schools a grade of A or B in the annual Gallup Poll of the Public’s Attitudes Toward the Public Schools increased from 36% to 42%. During that same interval the proportion of respondents who favored raising taxes to support the schools rose from 30% to 41%.

Thus, regardless of whether students are learning more as a result of reforms that use test results for quality control, there has been progress toward one of the major aims of such reforms: regaining public confidence in and support for the public schools. (Salganik, 1985)
"Effective teachers were usually defined as those who produce significant student achievement gains" (Billup & Rauth, 1984). Research is needed to determine if indeed the effective teachers do produce higher student test scores. This study will indicate if effective teachers, determined by the Texas Teacher Appraisal System, will produce higher student scores in math on the SAT.

The TTAS is based on research done by E.T. Emmer, C.S. Evertson, W. Doyle, M. J. Dunkin, and others. Research on teaching effectiveness examines correlations between teacher behaviors and student achievement gains. Rather than suggest that what the teacher did caused the learning, this research notes tendencies, i.e., if the teacher does this, student achievement probably will increase. (Texas Education Agency, 1986)

The TTAS is an appraisal instrument which evaluates how well the teacher manages the classroom, presents the subject matter, organizes, and uses instructional strategies. In short, the TTAS provides a score of teacher effectiveness. The teacher remains the key to a successful school and a school system. The TTAS is a means by which an appraiser can go into the classroom and observe how effectively a teacher operates.
The quality of student learning is inevitably linked to the quality of classroom teaching. Recommendations, legislation, and assessment can offer guidelines and point the way. But if improvement of student learning is the goal, classroom teachers must be the means. (Cross, 1987)

In order to determine the nature of the relationship between a teacher's effectiveness on the TTAS and a student's math score on the SAT, 110 students were selected from a suburban school district in the North Texas area. Only those students who had taken the quantitative portion of the SAT, had attended the same high school for at least three years, and had completed three years of academic math courses were included in this study. The teachers in this study were the math teachers of the 110 students.

Assumptions

The major assumptions underlying this study are:

1. The students performed to their highest potential on the SAT.

2. The academic level students in this study entered high school with basically the same math skills and abilities.
Limitations

The limitations of this study are:

1. Since the TTAS is a new appraisal system, some appraisers may lack confidence using it.

2. The effectiveness of this study will depend on the appraisers adhering to the state mandated procedures for using and scoring the TTAS and to the extent that the TTAS does measure effective teaching practices.

Definitions of Terms

1. Texas Teacher Appraisal System (TTAS) is a tool designed to collect samples of valid information about teaching, in a manner which can support reliable decisions about teacher performance. The TTAS is based upon the assumption that teaching is an intentional act which has as its goal student growth. (Texas Education Agency, 1986)

This appraisal instrument considers teacher performance in five domains: instructional strategies, classroom management and organization, presentation of subject matter, learning environment, and growth and responsibilities.

2. Scholastic Aptitude Test (SAT) is a two and one-half hour multiple-choice test which measures the verbal and mathematical reasoning abilities that are
important for success in college.

3. Observation Period is a 45 minute block of time during which the teacher is observed by an appraiser for the purpose of recording academic behaviors.

4. Academic Level Math is one of three levels a student may elect for his math curricula. It is the middle level and is not remedial or accelerated in content.

5. Teacher Supervisor is usually the school principal or assistant principals whose observation accounts for 60% of the teacher's total appraisal score.

6. Standard Expectation is the rating given to teaching behaviors which are expected to occur in the classroom.

Scholastic Aptitude Test - The Instrument

"The SAT is part of the testing program which is administered for the College Entrance Examination Board (CEEB) by the Educational Testing Service (ETS) of Princeton, New Jersey" (Walsh & Betz, 1985). This test is given to high school juniors and seniors at testing centers which are designated by test publishers. The SAT is given seven times annually during the months of January, March, May, June, October, November, and December.
The instrument is a two and one-half hour multiple-choice test which measures both verbal and mathematical reasoning abilities. The verbal portion has 85 questions which include verbal analogies, antonyms, sentence completions, and reading comprehension. The quantitative portion contains 60 items and is divided into two parts; items emphasizing logical reasoning and items calling for perception of mathematical relationships. The SAT requires as a math background only math taught from first to ninth grades.

Since 1953, raw scores have been determined by the formula \((\text{Number Right})-(\text{Number Wrong})/(k-1)\), where \(k\) = the number of choices. The scores reported to students and to schools are scaled scores, computed in such a way as to be comparable across different forms of the test and across different groups of test takers.

(Mitchell, 1985)

**Reliability**

The reliability of SAT scores is based primarily on an internal consistency estimation, using an adaptation (Dessel, 1940) of the familiar Kuder-Richardson 20 for use with formula scores. Typical internal consistency reliability coefficients exceed .90. Test-retest
correlations average approximately .87 for both the mathematical and verbal sections. Internal consistency reliability coefficients for the vocabulary and reading subscores hover around .875. (Mitchell, 1985)

Validity

Since the SAT is intended to help college admissions officials select and place students, students with high SAT scores should tend, then, to get higher grades in college than those with lower scores. In 1964 the College Board initiated its Validity Study Service to examine how well SAT scores correlated with external criteria as college grades. More than 3500 studies have been conducted at 750 colleges. SAT scores have shown to correlate with college performance. (Mitchell, 1985)

Texas Teacher Appraisal System - The Instrument

The Texas Teacher Appraisal System is composed of five major areas called domains. Each domain is divided into performance criteria and each criterion is made up of specific categories called indicators. The first four domains have indicators which can be observed in the classroom. The fifth domain, which relates to professional growth, is rated standard expectation unless otherwise documented by the
teacher's supervisor. The four domains which are observed in the classroom are: instructional strategies, classroom management and organization, presentation of subject matter, and learning environment. These domains consist of 55 indicators which will be marked absent/below expectation, standard expectation, or exceptional quality. Documentation must be given for absent/below expectation and exceptional quality. Documentation will include exactly what the teacher did or did not do to merit one of the above ratings.

In 1984, the Texas State Legislature mandated that the Texas Education Agency adopt a teacher appraisal system. The system is for the purpose of improving instruction, for encouraging professional growth, and for career ladder assignment.

The Texas Teacher Appraisal System developed to implement House Bill 72 is intended to encourage professional growth for both teachers and administrators and to improve instruction in the classrooms of Texas. In designing the system, efforts were made to build a practical, usable system that can be applied fairly to teachers in all subjects and grade levels. The teacher appraisal system does not attempt to assess all aspects, duties, and responsibilities of
teaching. In part, this is because the legislative requirements provide a more narrow focus, and, in part, because the state-of-the-art of teacher evaluation is not advanced to an operational level in some areas. Instead, the system has been based upon existing classroom based research on teaching, craft knowledge, and experience.

The teacher appraisal process emphasizes the professional growth of teachers but, because the teacher appraisal system was designed as part of the career ladder system for teachers established by the legislature, it also must serve the function of distinguishing among the performances of teachers across the state. In order to do so, the teacher appraisal process is designed to collect samples of valid information about teaching, in a manner which can support reliable decisions about teacher performances. (Texas Education Agency, 1986)

The Texas Education Agency (TEA) began the process of designing the TTAS by reviewing the latest research on teaching. They also investigated states that were using state appraisal systems. One hundred fifty-six Texas districts were randomly selected and questioned about the appraisal system used in their
districts. After reviewing these appraisal systems, a first draft of the state appraisal system was constructed. Thirty thousand teachers were sent a survey for the purpose of giving input to the appraisal instrument and about seventeen thousand teachers responded. TEA asked several experts to review the first draft of the appraisal instrument. A pilot study was conducted in the 1985-86 school year where local appraisers were trained to conduct the appraisals. During the first of February, 1986, TEA held a public hearing on the appraisal system. Revisions were made as a result of public input and findings of the pilot study. The state then organized its training program in order to prepare the appraisers to use the instrument in the 1986-87 school year.

The TTAS has six assumptions that are basic to this instrument. They are:

1. Teaching is an intentional act which has as its goal student growth. No single model of teaching is mandated by the statewide teacher appraisal system.

2. Although teaching varies across subject matter and grade level, some common teaching behaviors occur which can serve as areas of evaluation.
3. Most teachers will not exhibit all of the behaviors with a quality of performance which always exceeds expectations.

4. Each teacher is capable of improving.

5. Classroom teaching behaviors may vary according to the learning goals and objectives of the lesson observed.

6. Appraisal of teaching performances require classroom observation, therefore, the observers will be seeing the teacher exhibit what he or she can do, not necessarily what the teacher usually does. (Texas Education Agency, 1986)

Procedures for Implementation of the Study

Subjects

One hundred ten students were selected from a suburban high school in the North Texas area. The students selected for this study were seniors during the 1986-87 school year, were enrolled in academic level math classes, and attended the same high school for at least three years.

A list of 243 students who took the SAT during the 1986-87 school year was obtained from the high school counselor. Then each student's cumulative folder was searched to determine which of these students had attended the high school for at least 3
years, had taken academic level math courses and who their math teachers were. There were 110 academic level math students and all were used in this study. The high school principal provided the TTAS scores of these 110 students' math teachers and the researcher selected the teacher for each student with the highest TTAS score. There were 12 math teachers who taught one or more of the 110 students. Lastly, a list was compiled of the 110 academic level math students, their math SAT score, their sex, and their math teacher's TTAS score.

This information was analyzed by the Pearson product-moment correlation coefficient and the point biserial correlation coefficient. These statistical procedures indicated what relationship existed among the variables of the student's math scores, his math teacher's effectiveness rating, and the student's sex.

Research Design

This study was designed to determine the nature of the correlation between a student's math score and the effectiveness of the student's math teacher. The measures of mathematics were obtained through the scores of the SAT which were administered to the students during October 1986, November 1986, December 1986, or January 1987. The measures for teacher effectiveness were obtained through the scores on the
TTAS during the second appraisal of the 1986-87 school year.

The statistical procedure used to determine the acceptance or rejection of hypothesis 1 was the Pearson product-moment correlation coefficient. "It is used when both variables we wish to correlate are expressed as continuous scores. It can be calculated for any two variables no matter how they have been measured" (Borg & Gall, 1983).

The statistical procedure used to determine the acceptance or rejection of hypothesis 2 was the point biserial correlation. "It is used when one of the variables we wish to correlate is in the form of a continuous score and the other variable is in the form of a true dichotomy" (Borg & Gall, 1983).

Procedure for Collecting Data

The researcher obtained a printout from the high school counselor which listed the SAT math scores and the students' sex for 243 students for the 1986-87 school year. The researcher also obtained records from the principal which listed the TTAS scores of the math teachers for the 1986-87 school year.

The researcher examined the cumulative folders for each student on the printout to determine which were academic level math students. Next the researcher selected the student's math teacher with
the highest TTAS score in order to include only the most effective math teachers. Finally the researcher compiled a list which included 110 academic level math students, their SAT math score for the 1986-87 school year, the students' sex, and the students' math teacher with the highest TTAS rating of the 1986-87 school year.

Procedure forAnalyzing Data

The Pearson product-moment correlation coefficient determined the relationship between a student's math score as measured by the quantitative portion of the SAT and the effectiveness of the student's math teacher as measured by the TTAS. The results were presented in tabular form.

The point biserial correlation coefficient determined the relationship between a student's math score as measured by the quantitative portion of the SAT and the student's sex. The results were presented in tabular form.
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CHAPTER II

REVIEW OF RELATED LITERATURE

The decade of the 1980s has been one of reform in American education. Since 1983 and the publication of "A Nation At Risk," the public has perceived that the school system does not perform the same quality job as it did in earlier years. The public is basing this perception partially on the decline of test scores. "In the early 1980s 3 million dollars per year were spent for testing in a state about the size of Louisiana. It would be more for the larger states" (Lazarus, 1981). Why is all this concern, time, effort, and money being expended on testing? The simplest answer is to determine if the students are learning. Is testing a valid method for determining what the student has learned? Research is needed to determine if a test does or can, in fact, produce this information.

About two million of the high school students within the United States take the SAT each year and the numbers continue to increase. "The SAT has been a tradition in American education for more than 60 years" (McGee & Rose, 1982). "Nearly 1.5 million
members of the high school class of 1985-86 will have taken the Scholastic Aptitude Test by the time they graduate" (Crouse, 1986).

The SAT is divided into two main sections, verbal and quantitative. The verbal portion includes 25 antonyms, 15 analogies, 20 sentence completions, and 25 reading comprehension questions which are usually related to five passages.

The math portion contains 40 multiple choice questions and 20 quantitative comparison questions. The SAT also contains a Test of Standard Written English (TSWE) which includes 25 usage questions and 15 sentence completions. Lastly, the SAT contains an experimental section which is used to evaluate questions for future test editions.

The total time allowed for testing is three hours and it is broken into six 30 minutes periods. The student first reads the question and then must select the most correct answer from four or five given choices.

The scoring procedure is not complicated. The SAT scores are reported on a scale from 200 to 800. The scaled score corresponds to the raw score. You receive one point for each correct response. For each incorrect answer, deduct 1/4
of a point. Omitted questions are counted as 0. (Sommerfield, 1986)

What exactly is the SAT? Is it an achievement test or an aptitude test?

In 1926, when the SAT was first introduced into the College Board's admissions testing program, there was a tendency to think of scholastic aptitude as innate mental ability which if properly measured, should indicate how well a youngster could cope with school and college subjects. According to this view, a student's performance on any test of scholastic aptitude should be impervious to any kind of "coaching" or indeed, any type of academic instruction. (Dyer, 1987)

The schools, in hopes of raising test scores, have included mini-courses on test taking procedures. Many high school and private consultants offer courses designed to prepare students to score higher on the SAT. Some groups even guarantee improved scores after taking their course.

If a student's SAT scores could be shown to improve as a consequence of tutoring, then the test must be regarded as failing to measure "aptitude." The innate mental trait theory has long since been abandoned by the producers of the
SAT and by most psychologists. These days "scholastic aptitude" is usually regarded as a set of abilities that develop as a result of experiences in school, in the home, and elsewhere. (Dyer, 1987)

The SAT is, in fact, a norm-referenced test which measures both aptitude and achievement. The results of the report, "On Further Examination," published in 1977 by the blue ribbon committee set up to look at the problem of declining SAT scores were, "if the SAT were, as its title suggests, truly an aptitude test, students' scores should depend much more on their inherent aptitude than on their past education" (Lazarus, 1981).

As Lazarus points out in his book, Goodbye to Excellence, this makes no sense. A student's ability to do college work depends largely on success in earlier schooling, interests, goals, motivation, study habits, maturity, and other factors. The SAT is both an achievement test and an aptitude test.

The purpose of the SAT scores are "intended to supplement the secondary school record and other relevant information about the student in assessing competence for college work" (Crouse, 1986). The College Board and the Educational Testing Service continue to examine the SAT and review and evaluate
its effectiveness in predicting the students' success in college. Over 3,000 colleges now run their own studies to determine how effective the SAT is as the predictor of college success. "The results of these studies show overwhelmingly that the high school record and the SAT taken together are more effective in predicting freshman grades, than the high school record alone" (Crouse, 1986).

Is the SAT useful in actually preventing colleges from making errors when they admit or reject students from their programs?

The SAT can be useful to college admission officers only if it helps them admit applicants whom they would reject using only high school records.

If colleges admitted and rejected the same students, whether or not they used the SAT, the test would be redundant and could add nothing to actual college admissions decisions. This is in fact nearly the case. (Crouse, 1986)

Mr. Crouse, after evaluating 2,781 high school seniors in the National Longitudinal Study (NLS), determined colleges make identical admissions decisions, either to admit or reject, on more than 90% of their applicants whether they use high school
grades alone or high school grades plus the SAT. It is, in effect, statistically redundant.
(Crouse, 1986)

Warren W. Willingham and Leonard Ramist dispute this result. They cite the following five reasons that show Crouse is incorrect in his statement. Willingham and Ramist say "the SAT can make an important contribution to educational effectiveness and individual fairness" (Willingham & Ramist, 1982).

First, their use of the NLS data violates both common sense and psychometric sense. Trusheim and Crouse seem to assume that a student with a given SAT score and a given HSR (high school ranking) will perform as well in one college as in another.

Second, the authors ignore changes over the last 10 years when they report that "for purposes of predictive validity, national samples such as the NLS will give results much like the typical individual college."

Third, the Trusheim/Crouse data give a misleading impression of the usefulness of the SAT in improving the percentage of correct forecasts of student success or failure.

Fourth, the authors err in dismissing the question of where one places the cut off. "We
defined successful college freshman grades as an actual freshman grade-point average (cut off) of at least 2.5. -- although, again, our conclusions do not depend on this definition of success." To describe their analysis accurately, "at least" should actually read "more than." What might appear as trivial error actually results in a striking difference in the number identified as successful - 55% rather than 81%.

Fifth, the estimates described in our third point above are based on the NLS statistics in order to clarify the interpretations that Trusheim and Crouse have drawn. Results would be more favorable to the SAT if one used the huge compilations of more defensible college validity studies. (Willingham & Ramist, 1982)

So, if the SAT is a viable instrument to measure the effectiveness of our schools, it is also viable to determine the relationship of SAT scores to effective teachers. The Texas Teacher Appraisal System is based on the knowledge base of effective teaching practices and so should indicate which teachers are effective in our schools. If we define effectiveness as higher student test scores, then it is reasonable to study how SAT scores relate to effective teachers. Correlations can be made to determine if the effective
teachers have more students who score higher on the SAT. If there is a positive correlation then the most effective teachers could work with the students who score lower on the SAT and the nation's overall SAT scores would most likely increase. Thus, the public perception of the school's quality would improve.

The research of the effective teaching practices is relatively new. It has only been in the last ten to twenty years that actual classroom research has been conducted. Prior to that time teachers seeking advice on how to organize and manage their classrooms had to rely on psychological theories developed outside classroom settings or on the "bag of tricks" suggestions of individual teachers. Unfortunately many of the theory-based ideas were incorrect or impractical for classroom use, and the experience-based advice was unsystematic and often contradictory. As a result, teachers were often left with the impression that classroom management is purely an art rather than partly an applied science, and that "you have to find out what works best for you!" (Brophy, 1982)

Techniques have been identified which teachers can learn. These techniques will help teachers become more effective and provide students with more time to
master the objectives for which they will be held accountable.

Researchers like Jacob S. Kounin have proven that "well-functioning classrooms do not just happen. Instead, they result from consistent teachers' efforts to create, maintain, and (occasionally) restore conditions that foster effective learning" (Brophy, 1982).

One of the most important findings of Kounin's research was that he could tell effective teachers from ineffective teachers simply by the length of time they kept students engaged on a task. Additional research clearly proves that effective teachers employed certain techniques that less effective teachers did not.

One such effective technique which Kounin observed among the better teachers was "withitness." This behavior let the students know that the teacher was "with-it" and knew what was going on in the class. "Withitness" helped the teacher to detect inappropriate behavior early and to intervene early to lessen the chances for disruptive behavior.

Another effective technique Kounin observed was "overlappingness." This simply means that the teacher is able to do more than one thing at a time. Teachers who keep students engaged are able to instruct reading
groups and also answer questions from the other students or record attendance while conferring with a student. These teachers are able to handle routine duties and monitor individual needs without disrupting the classroom activities. The result is that the students remain on task and are not interrupted.

A third technique Kounin observed effective teachers using was momentum. These teachers tended to be well prepared and to go through the lesson without confusion. Interruptions can be decreased with proximity control, eye control, a brief comment from the teacher or appropriate variety within the lesson to prevent satiation. When students are actively engaged on a task, there are fewer student disruptions.

A fourth technique found by Kounin was the use of smooth transitions. An effective teacher moves from one activity to another without gaps of time or without giving opportunities for students to be side tracked. Again the students must have a focus presented to them or they will tend to focus their attention on less appropriate targets.

Brophy and Putnam (1979), Good and Brophy (1978, 1980), and Nash (1981) validated Kounin's research concerning planning before the year begins. "The process begins with advanced preparation and planning
done before the school year begins" (Brophy, 1985). Researchers like Evertson, Emmer, and Anderson made it clear that the seemingly automatic smooth-functioning that was observable throughout most of the school year in the classrooms of successful managers results from a great deal of preparation and organization at the beginning of the year. Successful managers spent a great deal of classroom time in the early weeks introducing rules and procedures. Room arrangements, materials storage, and other physical aspects had been prepared in advance. (Brophy, 1985)

People like Sanford and Evertson (1981), Emmer and Evertson (1980), and Moscowitz and Hagman (1976) also gave support to Kounin's work. "It is important for teachers to communicate their expectations clearly, monitor their students for compliance, and maintain student responsibility for engaging in and completing work assignments" (Brophy, 1982).

These effective teacher behaviors which were observed by Kounin are also documented by other researchers.

In a correlational study at the second and third grade level (Brophy & Evertson, 1976), and in an experimental study of instruction in first grade reading groups (Anderson, Evertson, & Brophy,
1979), indicators of withitness, overlappingness, and smoothness of lesson pacing and transitions were associated both with better group management and with better student learning. (Brophy, 1982)

During the 1970s and the 1980s Kounin's research helped to establish another very useful body of knowledge. The following diagram illustrates academic learning time. The explanation for this diagram is:

AT stands for Allocated Time, or the time available for instruction in some subject. Allocated time is the length of a period in
secondary schools and the length of time allowed for reading, math, social studies, or science in elementary schools. ET stands for Engaged Time, or the time that students actually spend working on assigned academic work during the period. TRO means Time Related to Outcome, or the amount of time students receive instruction or work actively with materials or activities that deal with objectives over which they will be tested or assessed in some way. LSR, MSR, and HSR on the diagram stand for Low Success Rate, Moderate Success Rate, and High Success Rate respectively. Each of these bars indicates conceptually the relative rates of success students enjoy in learning content or skills. The important bar is that of high success rate, because it is only when students operate at a high success rate that they truly learn and remember or understand. The combination of ET, TRO, and HSR produces the real point of the diagram, to produce an optimum time of ALT, or Academic Learning Time, or time when students are actively engaged in working successfully with materials related to objectives over which they will be tested. (Ponder & Feaster, 1987)

Effective classroom teachers provide more academic
learning time for their students than less effective teachers.

Classroom management techniques or procedures are important since these techniques do increase academic learning time or the time when the student is actively engaged on tasks for which he will be assessed. It is the "teacher's responsibility for organizing the classroom environment to bring about student involvement in learning tasks and to minimize disruptive and inappropriate behaviors" (Barber, 1985).

Jacob S. Kounin did not invent the techniques of classroom management. Teachers and classrooms were videotaped and analyzed and these techniques were seen reoccurring in the most effective classrooms. Kounin did name the techniques to provide teachers a method of communicating to each other. An enthusiastic, patient, loving teacher who establishes rapport, loves children, and makes his lesson interesting may not be effective in the classroom. A teacher who can demonstrate "withitness," "overlapping," smooth transitions, momentum, group focus, and variety to prevent satiation can be effective in getting students involved and preventing them from disrupting others.

Research on effective teaching practices continued during the 1970s and the 1980s at the
University of Texas Research and Development Center for Teacher Education in Austin. Emmer, Evertson, Sanford, Clements, and Worsham researched the junior high schools and the elementary schools for effective classroom management techniques. These researchers continued to validate Kounin's work. The techniques observed proved to be instrumental in increasing academic learning time.

While observing classrooms, the researchers discovered that effective junior high teachers do the following:

1. **Instructing students in rules and procedures.** Even though all of the teachers had rules and procedures, the more effective managers had more complete systems and were more successful in teaching and installing rules and procedures. Better managers were more explicit about what was desirable behavior.

2. **Monitoring student compliance with rules.** The more effective managers were rated as being more consistent in managing behavior. They were less likely to ignore disruptive behavior and were more likely to use the rules and procedures when giving feedback to the students. In short, effective teachers noted and reacted to departures from acceptable classroom behavior.
3. Developing student accountability for work. More effective managers kept better track of student progress and completion of assignments. They had stronger and more detailed accountability systems.

4. Communicating information. Effective managers were more successful in presenting information clearly, in giving directions, and in stating objectives. They were better able to segment complex tasks and break them down into step-by-step procedures. They also were assessed as having more understanding of their students' learning skills than the less effective managers.

5. Organizing instruction. More effective managers wasted less time in their activities and had more on-task time. (Everson & Emmer, 1985)

Researchers discovered that effective elementary teachers do the following:

1. Analyzing classroom tasks. Better managers demonstrated an ability to analyze the tasks of the first few weeks of school in precise detail. Their presentations to the students about rules, procedures, and assignments were very clear, and they provided specific feedback to students when inappropriate behavior occurred. Thus, these teachers seemed to have a better behavioral map
of the classroom and what was required for students to function within it.

2. Teaching the going-to-school skills. Better managers incorporated the teaching of rules and procedures as a very important part of instruction during the first few weeks. That is, they taught going-to-school skills by providing practice and moving through procedures, giving feedback, responding to signals, and pointing out to students when they were behaving appropriately.

3. Seeing the classroom from the student's perspective. Better organized teachers were able to see through the eyes of their students in planning the classroom and in introducing the students to new routines during the year. They appeared to predict what would confuse or distract their students and what would be of immediate concern to them.

4. Monitoring student behavior. The more successful teachers monitored students closely during the first few weeks and dealt with problems immediately. They did not ignore deviations from classroom rules and procedures. (Evertson & Emmer, 1985)

The overall goal of teachers, according to
Kounin, was to achieve more academic learning time. Evertson and Emmer recommend that effective classroom management systems be organized into three major areas in order to increase academic learning time. The three areas are: planning before the students arrive, management of the first few weeks of school, and maintaining classroom management throughout the year. Effective teachers must plan before the students arrive for class and determine expected student behaviors, formulate rules and procedures to facilitate appropriate behaviors, and decide on consequences for the inappropriate behaviors.

Teachers who develop effective management systems will determine expected student behaviors and communicate clearly to the students their expectations concerning appropriate behavior. Students must be given a chance to practice these appropriate behaviors since very different behaviors are required for different activities. For example, whole class instruction requires a different set of student behaviors than small group instruction.

When planning for the year, an effective teacher will formulate rules and classroom procedures from his expectations. "The purpose of classroom rules is to call students' attention to the areas of behavior and to create a strong expectation about what is or is not
acceptable" (Evertson & Emmer, 1982).

A teacher who strives to be a good manager in preparation for the year will decide on consequences. This allows the teacher to encourage appropriate behavior and to act consistently when inappropriate behavior occurs. Consequences should be formulated for appropriate as well as inappropriate behaviors. For example, students may be allowed five extra minutes for lunch if they lined up quickly. Students may be isolated from the class if they contribute to a classroom disruption.

An effective manager of classroom behavior begins on the first day of the school year. A good manager will monitor student behavior, manage inappropriate behavior and develop student accountability. Monitoring is important for it allows the teacher to intervene before the problem is severe. Prevention is the key. Teachers must monitor student assignments. If the assignments are not understood, too easy, or too difficult, the students will not be able to focus on the activity and will tend to develop their own focus which is often disruptive. After the first few days the teacher should be aware of the students who need to be checked on at frequent intervals.

When inappropriate behavior does occur the effective teacher:
1. Asks the student to stop the inappropriate behavior.

2. Makes eye-contact with the student when the teacher is sure the student knows what the correct procedure is.

3. Reminds the students of the correct procedure.

4. Asks the student to identify the correct procedure.

5. Imposes the consequences.

6. Changes the activity. (Evertson & Emmer, 1985)

The students must learn to be responsible for participating in class and completing their work. Effective teachers can help students achieve this by:

1. Clarity of work assignment. The teacher must have a specific set of expectations for student performance.

2. Communicating assignments. Assignments should be clear, so that every student understands what to do.

3. Monitoring student work. It is essential that the teacher be aware of student progress.

4. Checking work. The teacher needs a system of checking work.
5. Giving feedback to students. When students receive information about their performance, they obtain the basis for improvement.

6. Clarity in instruction. Clear instruction of academic content helps students succeed and learn. (Evertson & Emmer, 1982)

An effective teacher assumes the "responsibility for organizing the classroom environment to bring about student involvement in learning tasks and to minimize disruptive and inappropriate behaviors" (Evertson & Emmer, 1982).

Doyle also validated the research of Kounin, Emmer, and Evertson. He found that effective teachers had the students engaged 80-85% of the time for secondary schools and about 84% of the time for elementary schools. Only about 70% of the elementary students were engaged during the self-paced activities.

An effective teacher knows when to act. The most critical factor in management is timing. Mistakes in timing can eventually upset even the most elegantly planned activity.

Effective managers avoid the consequences of late interventions by anticipating what might happen and heading off misbehavior before it
occurs. To do this, teachers must have a store of working knowledge about how classrooms actually operate. (Doyle, 1985)

The research on effective teaching practices is very extensive. The TTAS is predicated on the knowledge base of effective teaching practices. For example, Domain I deals with instructional strategies and is supported by the following:

Effective teachers provide for active participation by students (Anderson, Evertson, and Brophy, 1979; Brophy and Evertson, 1974; Emmer, Evertson, and Anderson, 1980; Evertson, Emmer, and Brophy, 1978; Good and Grouws, 1977; Stallings and Kaskowitz, 1974).

Increased wait-time affects positively student achievement (Anderson, Evertson, and Brophy, 1979; Tobin and Capie, 1982) and increases the probability of student participation (Rowe, 1974; Tobin and Capie, 1982).

Effective teachers communicate the objective of the lesson (Emmer, Evertson, and Anderson, 1980). [Texas Education Agency, 1986]

Domain II relates to classroom management and organization and is based on the following research:

The structure of transitions is facilitated by
clear teacher directions to students on how to close the first activity, make changes, and begin the second activity (Gump, 1982).

The effective use of instructional time correlates positively with student engagement and achievement (Wildman and Borko, 1983; Curry, 1984; Gettinger, 1984; Doyle, 1985)

Effective classroom managers generally anticipate critical problems and organize the classroom and instruction to eliminate conditions conducive to their occurrence (Kounin, 1970; Emmer, 1982; Wildman and Borko, 1982; Doyle, 1985). [Texas Education Agency, 1986]

Domain III delineates important aspects of presenting subject matter. The following research supports this domain:

Advance organizers affect positively student achievement (Ausubel, 1963; Luiten, Ames, and Ackerman, 1980).

Effective teachers review the content of previous lessons which is needed for the upcoming presentation (Good and Grouws, 1979; Rosenshine, 1983).

Effective teachers provide many examples (Rosenshine, 1983). Examples and non-examples
are more effective than examples alone (Feldman, 1980). [Texas Education Agency, 1986]

Domain IV has to do with the learning environment of the classroom. Some of the effective teaching research which lends credibility to this domain is as follows:

Materials which are pertinent to the student affect student achievement gains and on-task behaviors (Stallings, 1976; McDonald, 1976; Okey, Capie, Ellett, and Johnson, 1978; Capie, Tobin, and Bowell, 1980).

Negative affective teacher behaviors can discourage learning (Rosenshine, 1980; Soar and Soar, 1979; Borich, Kask, and Kemp, 1979; Dunkin and Biddle, 1974).

A warm, positive environment affects student achievement (Berliner, 1979; Medley, 1979). [Texas Education Agency, 1986]

Additional research is needed to ascertain if a teacher who is determined to be effective by his rating on the TTAS does have students who score higher on the SAT. The public is demanding accountability for teachers. Pay scales are even tied to effective teaching practices as evidenced by the career ladder. Since the public desires higher test scores and school districts are pressuring the school administrators to
produce higher scores, additional research is necessary to prove whether effective teachers do, in fact, make a difference in student test scores.
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*Phi Delta Kappan*, 67, 346-352.


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CHAPTER III

METHODS AND PROCEDURES OF THE STUDY

Description of the Population

The 110 subjects in this study took the SAT either in October, November, December 1986 or January 1987. The subjects were divided by sex: 60 males and 50 females. All of the 110 subjects were seniors during the 1986-87 school year, were enrolled in academic level math classes, and attended the same high school for at least three years. This population was drawn from one high school in a suburban school district in the North Texas area.

Procedures for Conducting the Study

The researcher obtained a list of 243 students and their SAT scores from the high school senior class counselor. Each student’s cumulative folder was examined in order to determine which students had taken the academic level math courses and which math teachers these students had in high school. It was discovered that there were 110 academic level math students and 12 math teachers. Since there were so few students, the entire population was used for this study. Only the academic level math students were
considered in an attempt to limit student ability as a variable in this study.

The high school principal provided the researcher with the TTAS scores for the math teachers. The student's math teacher with the highest TTAS score was chosen in order to select only the most effective math teachers. A list was then compiled of the 110 academic level math students, the student's math teacher who had the highest TTAS score, and the students' sex.

The relationship of the student's SAT math score and his teacher's TTAS rating was analyzed by the Pearson product moment correlation coefficient. The relationship of the student's SAT math score and his sex was analyzed by the point biserial correlation coefficient. The results were shown in tabular form.

Scoring Procedures

The quantitative portion of the SAT was scored by the Educational Testing Service. The results were returned to the high school by the spring of 1987. The TTAS ratings were completed by the teacher supervisors by the middle of May 1987.

The SAT verbal and quantitative scores are reported on a scale from 200 to 800. Both of these scores make up the composite score.

The scaled score (200-800) corresponds to a raw
score. For each correct answer one point is given. For each incorrect answer 1/4 of a point is subtracted. If there is no response for a question, a zero is recorded. For example, if one has 40 correct answers and 20 incorrect answers, the raw score would be \( 40 - \frac{1}{4}(20) \) or \( 40 - 5 = 35 \). This score of 35 would be converted to a scaled score of 560 by a table which determines the correspondence between the raw score and the scaled score.

The TTAS is scored by the teacher supervisor who is usually the school principal or the school assistant principal. The teacher supervisor’s appraisal is weighted more heavily than is the other appraiser’s (60% - 40% respectively).

The teacher supervisor multiplies each of the five domain credit totals of his appraisal by .60 and each of the domain credit totals of the other appraiser by .40. Next the teacher supervisor adds the five weighted domain subtotals of his appraisal to the five weighted domain subtotals of the other appraiser’s appraisal to get the overall five domain totals. The five domain totals are converted to five domain scores by using the score conversion chart. Lastly, these five domain scores are added and then divided by five to yield the overall summary performance score. It is this score which is used to
assign the teacher a rating of clearly outstanding, exceeds expectation, satisfactory, below expectation, or unsatisfactory.

The SAT scores and the TTAS ratings were completed prior to this study. The researcher had no part in the scoring process.

Procedures for Analysis of Data

This study was designed to determine the nature of the correlation between a student's math score and the effectiveness of the student's math teacher. The measures of mathematics were obtained through the scores of the SAT which was administered to the students during October, November, December 1986 or January 1987. The measures of the teachers' effectiveness were obtained through the scores on the TTAS during the second appraisal period of the 1986-87 school year.

The following research hypotheses were tested.

1. There is no significant relationship between a student's math score as measured by the quantitative portion of the SAT and the effectiveness of the student's math teacher as measured by the TTAS.

2. There is no significant relationship between a student's math score as measured by the quantitative portion of the SAT and the student's sex.

The statistical procedure used to determine the
acceptance or the rejection of hypothesis one was the Pearson product-moment correlation coefficient. "It is used when both variables we wish to correlate are expressed as continuous scores. It can be calculated for any two variables no matter how they have been measured" (Borg & Gall, 1983). The Pearson product-moment correlation coefficient is the most widely used measure of correlation.

Measures of correlation by common convention are defined to take values ranging from -1 to +1. A value of -1 describes a perfect negative relation. All points lie on a straight line, and x decreases as y increases. A value of -1 describes a perfect positive relation. All points lie on a straight line, and x increases as y increases. A value of 0 means that x and y are independent of each other or bear a random relation to each other. (Ferguson, 1981)

The statistical procedure used to determine the acceptance or rejection of hypothesis two was the point biserial correlation coefficient. "It is used when one of the variables we wish to correlate is in the form of a continuous score and the other variable is in the form of a true dichotomy" (Borg & Gall, 1983). Actually, this study will use only a product-moment correlation because
The point biserial correlation is a product-moment correlation. If we assign a 1 to individuals in one category and a 0 to individuals in the other and calculate the product-moment correlation, the result is a point biserial coefficient. Weights other than 1 and 0 may be assigned to the categories. (Ferguson, 1981)

The researcher assigned the value of 1 for female and the value of 2 for male when the point biserial correlation coefficient was run to determine the relationship of the SAT score to the student's sex.
CHAPTER BIBLIOGRAPHY


CHAPTER IV

PRESENTATION OF THE FINDINGS

The problem of this study was to determine if there was a relationship between the student’s SAT math score and the student’s math teacher’s TTAS rating. The sample was taken from the academic level math courses in a suburban high school.

Each student took the quantitative portion of the SAT either in October 1986, November 1986, December 1986, or January 1987. Each teacher who taught math to these students was appraised by the school administrators in the spring of 1987.

Table 1 gives the descriptive statistics which include the mean, the standard deviation, the minimum scores, and the maximum scores of the students’ SAT scores and of the teachers’ TTAS ratings.

Table 1
Scores of the SAT and the TTAS

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>110</td>
<td>416.909</td>
<td>81.023</td>
<td>250</td>
<td>620</td>
</tr>
<tr>
<td>TTAS</td>
<td>110</td>
<td>4.246</td>
<td>.193</td>
<td>3.58</td>
<td>4.50</td>
</tr>
</tbody>
</table>

* Highest possible math SAT score is 800
* Highest possible TTAS score is 5.0
The mean for the 110 students who took the quantitative portion of the SAT was 416.909. The minimum score for all of the students was 250 while the maximum score was 620. The mean for the teachers who were appraised with the TTAS was 4.246. The minimum score was 3.58 and the maximum score was 4.50. Since the TTAS scoring allows a teacher with a 3.0 or above to be classified as "exceeds expectation" or "clearly outstanding" all teachers in this study proved to be effective according to this instrument.

Testing the Hypotheses

After the data was gathered the statistical analyses were compiled. The procedure used to determine the correlation of the students' SAT scores to the teachers' TTAS ratings was the Pearson product-moment correlation coefficient. The point biserial correlation coefficient was used to determine the correlation of the students' SAT scores to the students' sex.

The point biserial correlation is a product-moment correlation. If we assign a 1 to individuals in one category and a 0 to individuals in the other and calculate the product-moment correlation, the result is a point biserial coefficient. Weights other than 1 and 0
may be assigned to the categories. (Ferguson, 1981)

The Pearson product-moment correlation coefficient is the most widely used measure of correlation. Measures of correlation by common convention are defined to take values ranging from -1 to +1. A value of -1 describes a perfect negative relation. All points lie on a straight line, and x decreases as y increases. A value of +1 describes a perfect positive relation. All points lie on a straight line and x increases as y increases. A value of 0 means that x and y are independent of each other or bear a random relation to each other. (Ferguson, 1981)

The statistical results of this study were not significant at the .05 level. There is no relationship between a student's SAT score and his math teacher's TTAS rating and there is no significant relationship between a student's SAT score and the student's sex. However, there is a slight correlation between the highest SAT mean scores and the highest mean score of the TTAS. Also there is a slight correlation between the SAT scores and the student's sex.

The Pearson product-moment correlation
coefficient shows in Table 2 that there is no significant relationship between students' math scores on the SAT and the students' math teachers' TTAS ratings.

Table 2

The Pearson Product-Moment Correlation Coefficient Between The SAT Scores and the TTAS Ratings

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>SAT</th>
<th>TTAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>110</td>
<td>1.0000</td>
<td>.2711</td>
</tr>
<tr>
<td>TTAS</td>
<td>110</td>
<td>.2711</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

This table shows that there is a perfect positive correlation (1.0000) between the SAT and itself and between the TTAS and itself. The coefficient of .2711 is not significant for the SAT or the TTAS.

The point biserial correlation coefficient in Table 3 shows that there is no significant relationship between the SAT scores and the students' sex.

Table 3

The Point Biserial Correlation Coefficient Between SAT and Sex

<table>
<thead>
<tr>
<th>Variable</th>
<th>SAT</th>
<th>SEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>1.0000</td>
<td>.3498</td>
</tr>
<tr>
<td>SEX</td>
<td>.3498</td>
<td>1.0000</td>
</tr>
</tbody>
</table>
This table shows that there is perfect positive correlation (1.0000) between the SAT and itself and between sex and itself. The coefficient of .3498 for the SAT and sex is not significant. Again, it should be noted that the point biserial correlation coefficient is used when you have a dichotomous variable (sex) and a continuous variable (SAT). Once a value is given to a variable (females) and another value is given to the second variable (males) the point biserial correlation then becomes a product moment correlation.

To further prove that there is no significant relationship in this study a scattergram and a t-test were run. For the purpose of the statistical analyses in this study, the dependent variables were the students' SAT math scores and their teachers' TTAS ratings. The independent variable was the students' sex.

Table 4 is a scattergram which visually shows that there is no significant relationship between the students' SAT scores and the students' math teachers' TTAS scores.
Table 4

A Scattergram Showing the Relationship of the SAT to the TTAS

This table does show, however, that there is a very slight correlation between the SAT scores and the teachers' TTAS ratings.

Table 5 is a scattergram which visually shows that there is no significant relationship between the students' SAT scores and the students' sex.
Again, this table does show that there is a very slight correlation between the SAT scores and the students' sex.

In addition to the scattergram a $t$ test was also run. Table 6 shows the number of cases, the mean, the standard deviation, and the $t$ value for the two variables, the SAT and the TTAS scores.
Table 6
A $t$ Test Indicating the Difference Between the SAT Scores and the TTAS Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>$t$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>110</td>
<td>416.9091</td>
<td>81.023</td>
<td></td>
</tr>
<tr>
<td>TTAS</td>
<td>110</td>
<td>4.2456</td>
<td>0.193</td>
<td>53.45</td>
</tr>
</tbody>
</table>

Table 6 shows that the mean for SAT scores is 416.9091 and that the mean for the TTAS scores is 4.2456. The standard deviation for the SAT scores is 81.023 and the standard deviation for the TTAS scores is 0.193. The $t$ value is 53.45 and it is not significant.

Table 7 shows the number of cases, the mean, the standard deviation, and the $t$ value for the two variables.

Table 7
A $t$ Test Indicating the Difference Between the SAT Scores and the Students’ Sex

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>$t$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>416.9091</td>
<td>81.023</td>
<td>53.88</td>
</tr>
<tr>
<td>SEX</td>
<td>1.5455</td>
<td>0.500</td>
<td></td>
</tr>
</tbody>
</table>

This table shows the mean for the SAT scores is 416.9091 and the mean for the students’ sex is 1.5455. The standard deviation for the SAT scores is
81.023 and the standard deviation for the students' sex is 0.500. The t value is 53.88 and it is not significant.

Table 8 shows the mean, minimum score and maximum score for the SAT for both male and female students. It also shows the mean, minimum score and maximum score for the math teachers who taught these students.

Table 8
SAT Scores and TTAS Ratings Grouped According to Students' Sex

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<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
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<td>SAT (Female)</td>
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<td>TTAS (Teachers of Female Students)</td>
<td>4.21</td>
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The mean SAT math score for males was 443 while the mean SAT math score for females was 386. The lowest SAT score for males was 260 while the lowest SAT score for females was 250. The highest SAT score for males was 620 while the highest SAT score for females was 500. This table indicates that a male student scored 120 points higher than the highest score of a female
student on the quantitative portion of the SAT.

The mean TTAS score for the math teachers who taught the male students was 4.27. The mean TTAS score for the math teachers who taught the female students was 4.21. This table further indicates that the teachers who taught the male students were slightly more effective than the teachers who taught the female students.

The following research hypotheses were tested:

1. There is no significant relationship between a student's math score as measured by the quantitative portion of the SAT and the effectiveness of the student's math teacher as measured by the TTAS. Table 2 shows a coefficient of .2711 and it is not significant for the SAT and the TTAS. Table 4 also shows no significant relationship between the SAT and the TTAS. However, Table 4 and Table 8 do reveal a very slight correlation of the male students' math scores with their math teachers' TTAS scores. That is, male students tended to score higher on the quantitative portion of the SAT (mean 443) than did the female students (mean 386). In addition the math teachers who taught the male students had a slightly higher mean score on the TTAS rating (4.27) than the teachers who taught the female students (4.21). This implies that the teachers of the male students were
slightly more effective. Table 6 shows a t value of 43.45 and it is not significant. Therefore, there is no significant relationship between the SAT and the TTAS.

2. There is no significant relationship between a student's math score as measured by the quantitative portion of the SAT and the student's sex. Table 3 shows the coefficient of .3498 and it is not significant for the SAT and the student's sex. Table 5 shows no significant relationship between the SAT scores and the students' sex. However, Tables 5 and 8 indicate a slight correlation which shows that the male students scored higher overall than did the female students. Table 7 shows a t value of 53.88 and it is not significant. Therefore, there is no significant relationship between the SAT and the students' sex.
CHAPTER BIBLIOGRAPHY


CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, IMPLICATIONS
AND RECOMMENDATIONS

Summary

The first purpose of this study was to determine the scores on the quantitative portion of the SAT for 110 students and these students' math teachers' ratings on the TTAS. The second purpose was to determine the nature of the relationship of the students' SAT scores to their teachers' TTAS ratings. The third purpose was to determine the nature of the relationship of the students' SAT scores to their sex.

It was hypothesized that

1. There is no significant relationship between a student's math score as measured by the quantitative portion of the SAT and the effectiveness of the student's math teacher as measured by the TTAS.

2. There is no significant relationship between a student's math score as measured by the quantitative portion of the SAT and the student's sex.

The 110 subjects in this study who took the quantitative portion of the SAT were comprised of 60 male students and 50 female students. This sample was
drawn from a large suburban high school in the North Texas area. The students were seniors during the 1986-87 school year, were enrolled in academic level math classes, and attended the same high school for at least three years. They took the SAT in either October 1986, November 1986, December 1986, or January 1987. All of the math teachers of these students were appraised by the school administrators during the spring of 1987. There was a total of 12 math teachers who taught the 110 students. These students were paired with their math teacher for the statistical procedures. For the purposes of this study the teacher data were duplicated and the statistics show 110 teachers for the 110 students.

The data were analyzed by the Pearson product-moment correlation coefficient and the point biserial correlation coefficient. A scattergram and a t test were also run to further check for significant relationships among the variables of the students' SAT math scores, their teachers' TTAS ratings, and the students' SAT scores and the students' sex.

Findings

The Pearson coefficient showed no statistical significance for a significant relationship between a higher SAT score and a math teacher's higher TTAS rating (Table 2). There was also no significant
relationship between male and female SAT scores (Table 3) as measured by the point biserial correlation coefficient.

The 110 students took the quantitative portion of the SAT. Out of this group of 60 males and 50 females, the overall mean SAT score for the entire group was 416.909 with the lowest score being 250 and the highest score being 620 (Table 1). The mean SAT score for the 60 males was 443 with the lowest score being 260 and the highest score being 620. The mean SAT score for the 50 females was 386 with the lowest score being 250 and the highest score being 500 (Table 8). This information does reveal that the male students scored higher on the quantitative portion of the SAT than did the female students. (The highest male score was 620 and the highest female score was 500.)

It is also interesting to note that the math teachers who taught the male students had a TTAS mean rating of 4.27 while the math teachers who taught the female students had a TTAS mean rating of 4.21 (Table 8). Therefore, although it is not statistically significant, the teachers who taught the male students were more effective teachers based on their TTAS ratings. Since the male students did score higher on the SAT, it can be said that there is a slight
correlation between effective teachers and higher male student scores on the quantitative portion of the SAT.

The $t$ test indicates no statistical significance between higher SAT scores and higher TTAS ratings (Table 6) or higher SAT scores for either male or female students (Table 7). The scattergrams visually support a slight correlation among higher SAT scores and higher TTAS ratings (Table 4) and between the SAT scores and the students' sex (Table 5).

Conclusions

1. There is no significant relationship between a student's math score as measured by the quantitative portion of the SAT and the effectiveness of the student's math teacher as measured by the TTAS.

2. There is no significant relationship between a student's math score as measured by the quantitative portion of the SAT and the student's sex.

However, the data does show that the more effective teachers, as indicated by their higher TTAS ratings, did teach students who had higher SAT scores. Also this data indicated that males scored higher than females on the quantitative portion of the SAT.

Implications

The findings of this study suggest, that although the results were not significant, the better teachers
did instruct students who scored higher on the SAT. The implication is that if the best teachers instruct the less able students, the overall test scores should rise slightly. This is important for the school districts to note since the public is demanding accountability of the schools based on test scores.

A second implication indicated by this study is that female students should be encouraged and motivated in the field of mathematics. Typically, this area appears to appeal more to males. If it is important for the females to improve their quantitative SAT scores, additional incentives, coursework, and motivation are indicated for female students.

A problem of teacher morale could be manifested in these implications. Generally, most teachers prefer teaching the more able students. If the most effective teachers are relegated to teaching the less able students, a higher teacher attrition rate may occur. School administrators and colleges of education will have to address this problem or face lower teacher morale and a lack of qualified math teachers.

Additional research is needed in this area of whether effective teachers actually produce significantly higher student test scores. If an
affirmative answer is found, an additional implication of these future studies would be to present to teachers the training necessary to make them more effective. Texas, with the TTAS, is attempting to improve the teaching skills of teachers. School administrators and appraisers must assume the responsibility of not only appraising teachers according to the state training procedures, but to remediate the deficiencies which are exhibited by the TTAS.

Administrators will need to assume the role of educational leader in their schools. They must visit classrooms daily in order to see first hand what the teacher can and cannot do in the areas of instruction and classroom discipline. These leaders will need to make suggestions to the teachers on how to improve the delivery of their material and how to maintain an orderly classroom environment. A suggestion might be as simple as directing the teacher to state a clear concise learner objective. The administrative suggestion could be as involved as writing a professional growth plan in concert with the teacher. This plan would develop methods for improving instruction, include a time line, and give methods of evaluating the teacher's improvement. The TTAS must be seen as a tool to remediate problems dealing with
instruction and classroom management. For lack of better methods the parents view test scores as an indicator of school quality. School leaders must assist the teachers in becoming as effective as possible in order to raise student test scores.

Recommendations for Future Study

This study did reveal some slight relationships, although not statistically significant, between effective classroom teachers and higher student test scores. In order to expand the results of this study additional research is needed in the areas of measuring how effective teachers perform in the classroom and how effective our public schools are in imparting knowledge to the students. The following are suggestions for future studies.

1. To determine if the TTAS is a predictor of teacher effectiveness.

2. To determine if the appraisers in Texas are following state mandated training procedures when using the TTAS.

3. To determine if the quantitative portion of the SAT is sexually biased.

4. To determine if the SAT is a predictor of student ability.

5. To determine if teachers treat both male and female students the same.
6. To determine if the high school curriculum tends to favor one sex more than the other.
CHAPTER BIBLIOGRAPHY


APPENDIX A

STUDENT MATH SAT SCORES

AND THEIR MATH TEACHERS TTAS SCORES
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1 = Female (F)  
2 = Male (M)
APPENDIX B

TEXAS TEACHER APPRAISAL SYSTEM
I. Instructional Strategies

1. Provides opportunities for students to participate actively and successfully.

   a. varies activities
   b. interacts with students
   c. solicits participation
   d. extends
   e. provides time
   f. implements at appropriate level of difficulty

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2. Evaluates and provides feedback on student progress during instruction.

   a. communicates expectations
   b. monitors
   c. solicits responses for assessment
   d. reinforces
   e. provides corrective feedback
   f. reteaches

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FOR EVALUATION RECORD
DOMAIN CREDIT TOTAL
(5 credits + EQ credits)
## Classroom Management and Organization

### 3. Organizes materials and students.

- Secures student attention
- Uses procedures/ routines
- Gives administrative directions
- Uses seating/grouping
- Has materials/supplies ready

### 4. Maximizes amount of time available for instruction.

- Begins/ends
- Implements sequence of activities
- Maintains pace
- Maintains focus
- Keeps students engaged

### 5. Manages student behavior.

- Specifies expectations
- Prevents off-task/behaviors
- Restricts off-task behavior
- Stops inappropriate behavior
- Stops disruptive behavior
- Applies rules
- Reinforces appropriate behavior

## Presentation of Subject Matter

### 6. Teaches for cognitive, affective, and/or psychomotor learning and transfer.

- Begins with introduction
- Uses content sequence
- Relates prior/future learning
- Defines/describes
- Elaborates critical attributes
- Stresses generalization/principle
- Transfers
- closes instruction

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<tr>
<th>ARE</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQ</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

---

FOR EVALUATION RECORD

DOMAIN CREDIT TOTAL

(5E credits + EQ credits)
### III. Presentation of Subject Matter (continued)

<table>
<thead>
<tr>
<th>7. Presents information accurately and clearly.</th>
<th>Columns</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. makes no significant errors</td>
<td>A</td>
</tr>
<tr>
<td>b. uses appropriate vocabulary</td>
<td>B</td>
</tr>
<tr>
<td>c. explains clearly</td>
<td>E</td>
</tr>
<tr>
<td>d. stresses point/dimensions</td>
<td>E</td>
</tr>
<tr>
<td>e. clarifies misunderstanding</td>
<td>EQ</td>
</tr>
</tbody>
</table>

| a. uses correct grammar                       |         |
| b. pronounces correctly/clearly               |         |
| c. uses accurate language                     |         |
| d. demonstrates written skills                |         |

### IV. Learning Environment

<table>
<thead>
<tr>
<th>9. Uses strategies to motivate students for learning.</th>
<th>Columns</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. relates to interests</td>
<td></td>
</tr>
<tr>
<td>b. emphasizes value/importance</td>
<td></td>
</tr>
<tr>
<td>c. sets specific goals</td>
<td></td>
</tr>
<tr>
<td>d. challenges</td>
<td></td>
</tr>
</tbody>
</table>

| a. avoids sarcasm/negative criticism                |         |
| b. maintains courteous climate                      |         |
| c. encourages                                        |         |
| d. praises                                           |         |
| e. establishes rapport                               |         |
V. Growth and Responsibilities

11. Plans for and engages in professional development.
   - a. grows professionally
   - b. stays current-content
   - c. stays current-methods

12. Interacts and communicates with parents.
   - a. initiates communications
   - b. conducts conferences
   - c. maintains confidentiality

13. Complies with policies, operating procedures, and requirements.
   - a. follows TEA requirements
   - b. follows district/school policies/procedures
   - c. performs assigned duties
   - d. follows promotion procedures

   - a. participates in goal-setting
   - b. plans instruction
   - c. documents progress
   - d. maintains records
   - e. reports progress

Comments:

(The signature of the teacher indicates that he/she has reviewed and received a copy of this record.)
BIBLIOGRAPHY

Books


BIBLIOGRAPHY

Articles


Crouse, J. (1986). Should a million and a half students be required to take the SAT next year? Phi Delta Kappan, 67, 346-352.


Kappan, 66, 675-681.


