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ABSTRACT

During the 1996 electoral season, public schools and teachers' unions have been repeatedly attacked by Republican candidates as the cause of intellectual and moral decline among American youth. The Institute for Wisconsin's Future initiated an updated review of the impact of collective bargaining among teachers on the performance levels of school children. This document presents findings of their study, which examines the impact of collective bargaining along with that of region, family income, race, school spending, and levels of private school attendance. The study focused on the relationship between high, medium, and low levels of unionization among teachers and the test scores of public school students on the 1995 Scholastic Aptitude (SAT) College Entrance exams and the 1994 National Assessment of Educational Progress (NAEP) fourth-grade reading tests in a state-by-state comparison. Findings indicate that student performance on the tests was significantly better in states with high levels of unionization with all other variables held constant. Average student scores on the SAT exams were 43 points higher in states where over 90 percent of teachers were unionized than in states where less than 50 percent of the teachers were covered by collective bargaining or meet-and-confer agreements. Furthermore, when collective bargaining was removed from the analysis, scores dropped in all states. Those factors found to be significantly related to poor performance included low household income, race (which was correlated with other measures of socioeconomic deprivation), large class size, high absenteeism, and higher rates of private school attendance. The underlying causes of poor performance among children were primarily socioeconomic factors in children's lives and the lack of adequate educational resources. Seven tables are included. (Contains 12 references.) (LMI)

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October, 1996

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# I. EXECUTIVE SUMMARY

During this 1996 electoral season, public schools and teachers' unions have been repeatedly attacked by Republican candidates as the cause of intellectual and moral decline among American youth. These largely undocumented assertions are situated in the context of a campaign to provide vouchers for privatized education and create a dual educational system in which more children are in private schools.

To evaluate these claims, the Institute for Wisconsin's Future initiated an updated review of the impact of collective bargaining among teachers on the performance levels of school children. This study examines the impact of collective bargaining along with that of region, family income, race, school spending and levels of private school attendance. The focus of the study is the relationship between high, medium and low levels of unionization among teachers and student test scores on the SAT College Entrance exams and the NAEP fourth grade reading tests in a state-by-state comparison.

The results of this study demonstrate clearly that student performance on the tests is significantly better in states with high levels of unionization with all other variables held constant. Average student scores on the SAT exams are 43 points higher in states where over 90% of teachers are unionized than in states where less than 50% of the teachers are covered by collective bargaining or meet-and-confer agreements. Furthermore, when collective bargaining is removed from the analysis, scores drop in **all states.** Those factors found to be significantly related to poor performance are: low household income, race (which is correlated with other measures of socio-economic deprivation), large class size, high absenteeism, and higher rates of private school attendance.

Our findings accord with numerous earlier research studies which show that collective bargaining among teachers does not harm student school performance. In the last ten years, school performance among all children has been improving. Differences in performance occur more **between** states than over time periods. In fact, report after report demonstrates that unionization is associated with more stable, productive school environments with higher test scores. The underlying causes of poor performance among children are primarily socio-economic factors in children's lives and the lack of adequate educational resources.

Public education faces serious problems but teachers organizing to secure decent wages and working conditions is not one of them. Growing poverty, social instability, high rates of mobility and household disorganization devastate children's lives. Governmental cuts in resources for school hiring, teacher training and educational resources have led to larger class size, inadequate educational materials and reduced programming in many schools. Increased learning disabilities and behavior problems compound the problems in more crowded classrooms. Advocates of privatized education claim they will improve student performance by "breaking the educational monopoly of public schools and teachers' unions." Data from this study demonstrates that "breaking the unions" will hurt, not help students' performance.

## II. INTRODUCTION

The conservative attack on public education in general and teachers' unions in particular has grown more heated. Public schools and teachers' unions are held culpable for declining test scores, failing to prepare students for the workforce, reduced intellectual capacity among American young people and a deteriorating work ethic. Robert Dole has focused on this issue in presidential campaign speeches attacking teachers' unions as the principal cause of academic decline. In a national column, pundit Cal Thomas stated that, "the National Education Association promotes its own narrow agenda while working against the interest of most children and their parents." This war on public education and unionized teachers waged through conservative think tanks and their media spokespersons is based on a viewpoint that public education is a non-competitive monopoly. According to this analysis, educational improvements can only be achieved by breaking up the public school monopoly and the monopoly of the teachers' union, privatizing education and creating a deregulated educational marketplace.

These negative views of public education and the impact of teachers' unions are at variance with a number of reputable studies that have researched the impact of teacher unionization on student performance. These studies demonstrate that:

a) scores in many national performance tests are improving, particularly in some regions of the country;

b) the primary variations in test scores occur between states, not over time;

c) teachers' unions have increased productivity and quality in schools by helping to regulate working conditions;

d) the real determinants of lower student performance are primarily socio-economic factors in children's lives and educational resources.

Following a review of this body of research, IWF provides an updated examination of whether collective bargaining has a negative impact on student performance in a state-by-state analysis of the relationship between levels of teacher unionization and student scores on two national tests of student knowledge.

## III. PRIOR RESEARCH

In February, 1990, at the request of the Bush Administration, the Strategic Studies Center at the Sandia National Laboratory in New Mexico began a comprehensive review of the effectiveness of K-12 education in the United States. The request was apparently made in the belief that the Laboratory would find a system of failing K-12 schools, thus providing a rationale for a national school voucher system.

To the surprise of many K-12 critics, the researchers at Sandia reported the following conclusion in April, 1992: "Our most detailed analyses to date have focused on popular measures used to discuss the status of education in America. We looked at data over time to put performance of the current system in proper perspective. To our surprise, on nearly every measure we found steady or slightly improving trends". (Carson, Huelskamp, and Woodall, p.259).

A 1996 report by the National Science Foundation found that student achievement in Math and Science as measured by the National Assessment of Educational Progress exams has improved for all ethnic groups over the last 15 years. These achievements vary widely from state to state with some states performing at a level equal to the best performing nations in the world and some states at a level equal to the worst performing nations. In addition, the racial gap in performance levels, while still evident, was narrowing.

A 1996 report by the college board indicates that American students continue to improve their SAT scores. Math scores were the best in more than two decades. The scores on ACT college entrance tests have also risen. (Tabor; 2/27/96).

In **The Manufactured Crisis** (1995), authors Berliner and Biddle challenge those who argue that today's students are not as intelligent or able as students of the past. They offer the following points: "... since 1932 the mean IQ for white Americans age two to 75 has risen about .3 points each year (p. 43). Scores for other groups are not available. In the United States, today's youth probably average about 15 IQ points higher than did their grandparents and 7.5 points higher than their parents on the Stanford-Binet and Wechsler tests". (p. 43).

Berliner and Biddle note that "... evidence from the NAEP also does not confirm the myth of a recent decline in American student achievement. Instead, it indicates a general pattern of stable achievement combined with modest growth in achievement among students from minority groups and from 'less advantaged' backgrounds". (pp. 25-26).

In addition to schooling, other factors that determine student performance are social factors such as family size, household income, race, gender, region and discrimination. In a critical examination of state and regional variations in SAT performance, Powell and Steelman found that the decline in national test scores cited by critics of public education did not reflect the major test score differences **between** states which are much larger than the decline in test scores **over time.** Studies asserting a pattern of lowered College entrance test scores over time have failed to adjust for the increased number of students taking the tests as college education becomes an option for more than an elite minority. These variations in test score results on a state-by-state basis were due to factors such as family income, percentage of students taking the test, race, gender, class size, urbanization, etc. (Powell and Steelman; 1984). In their 1996 study, Powell and Steelman found that higher per pupil expenditures and lower teacher/student ratios are significantly correlated with higher test scores on the SAT and ACT exams. Graham and Husted replicated the 1984 Powell findings in a 1992 comprehensive analysis of test scores and the socio-demographic characteristics of the test takers and their families. The findings showed that race, sex, income and parents' educational level are significant determinants of student performance in addition to state participation rates. Denigration of public schools and their teachers based on studies that do not include these key variables have no basis in fact. (Graham and Husted; 1993).

Studies on the impact of teacher unionization show that, overall, students benefit. An analysis of teacher unions and productivity found that union school districts are seven percent more productive for average students and three percent more effective overall (Ebert and Stone, 1987). Freeman and Medoff (1979) and other research indicates that unions may increase productivity by reducing worker turnover in the schools, expanding teacher training opportunities and improving communication between workers and management. Richard Murnane found that seniority rules for teaching contracts that base wage levels and job security on seniority promoted the educational goals of public education more effectively than performance-based contracts. (Murnane; 1987).

A 1991 report by Paul Grimes and Charles Register examines the impact of teachers' unions on the test performance of African American students on the SAT exam. The article **teachers' unions**

**and Black Students' Scores on College Entrance Exams** demonstrates that external factors such as class size, size and location of school, race and socio-economic status are significant factors in determining student test performance and that all students in unionized schools scored 3 percent higher on SAT exams. Holding other factors constant, African-American students in unionized schools score almost 104 points above the black students in non-union schools. (Grimes and Register; 1991).

One study by Michael Kurth in 1987 often cited by conservatives contradicts these findings. In a published comment on the Kurth article, Nelson and Gould (1988) demonstrate that the Kurth study has serious deficiencies in its methodology. These include a failure to establish a base relationship between test performance and the level of collective bargaining before Kurth postulated the increase in collective bargaining as a cause for the fall in test scores. There were numerous other problems in the methodology:

- Kurth misrepresented variations in SAT scores and failed to take into account the percentage of high school graduates taking the test in each state.
- His study used inconsistent and inappropriate timing factors (i.e. the lag time between initial unionization and that period of impact on student performance).
- The research included states with collective bargaining agreements in the block of non-union states.
- The research failed to include variables such as race and gender (factors that Powell and Steelman had found to be significant indicators of state performance levels in 1984).
- The research mistimed the lag effects of social changes such as family size, stability and levels of parent education. (Nelson and Gould, 1988).

Nelson and Gould corrected many of the problems in the Kurth analysis and found that "the results clearly indicate that collective bargaining is associated with **higher** SAT scores no matter what equation is used ..." (Nelson and Gould, 1988).

Despite the research showing that unions are not responsible for poor test scores, school violence and all other forms of educational pathology, advocates of privatization continue to assail public education and teachers. The Institute for Wisconsin's Future initiated this study to update and re-analyze data on standardized testing by both high school students and grade school students to assess if collective bargaining among teachers in Wisconsin and other states negatively impacts the performance of students.

# IV. METHODOLOGY

## A. Measures of Performance.

This study utilizes the 1995 SAT scores for public and private high school seniors from the Educational Testing Services as well as scores from the 1994 NAEP grade four reading exams for public school systems as the indicators for students' performance.

The Scholastic Aptitude Test (now called the Scholastic Assessment Test) was originally normed in 1941 on a population of 10,654 white males who primarily attended private universities in the East. The test measures student knowledge in two areas, verbal and mathematical, and is designed to predict academic success in college. Scores on the SAT are not reported as the number or percent of correct answers (there are 138 questions), but as a scale score, ranging from 400 to 1,600.

In this study, the SAT scores are adjusted based on the percentage of high school seniors taking the exams in each state, because in some states a low percentage of test takers (the very best students who intend to go to out-of-state schools) naturally raises the average score. In some parts of the country, the ACT is more commonly used than the SAT. Measurement experts who have investigated the drop in SAT scores have concluded that the most important reason for the decline was due to the fact that a greater number of students, especially those with weaker high school records, began to take the SAT. In short, beginning in the mid-1960's, takers of the SAT became a less elite population of high school students. Thus, in recent years, more than one million students take the SAT annually. Compare this figure with the 10,654 who originally took the SAT in 1941.

The National Assessment of Educational Progress (NAEP) reading tests are representative of all fourth graders in public schools. Since 1969, the NAEP has tested national samples of students ages nine, thirteen, and seventeen. Only fourth grade reading scores have been released on a state-by-state basis.

**B. Dependent Variables.**

Union impact is measured by the percentage of teachers in each state covered by either collective bargaining or meet-and-confer agreements. States are considered highly unionized if over 90% of teachers are covered by collective bargaining agreements. The state is designated as moderately unionized state if 50-90% of the teachers are covered by collective bargaining or meet-and-confer agreements. The state is designated a non-union state if less than 50% of state teachers are covered by collective bargaining or meet-and-confer agreements. The three-way classification was created for presentation purposes. The statistical model is based on the percent of teachers in districts with collective bargaining contracts.

**C. Independent Variables**

Regression analysis is used to weight the impact of race, income, school expenditures and urbanization on school performance levels. The percent of high school seniors taking the SAT test in each state is factored into the analysis and shown as a separate outcome for the SAT impact analysis.

**D. Sources of Data**

*Test Takers* is the percentage of high school graduates taking the SAT, and *Test Takers Squared* is the quadratic term necessary to describe the non-linear relationship between *Test Takers* and *Sat Score* identified by Powell and Steelman (1984).

The union variables are based on new data (U.S. Department of Education). *Collective Bargaining and Meet-and-Confer Only* are based on 1994 Schools and Staffing Survey from the National Center for Education Statistics in 1994. The *Spending Per Pupil* (current expenditures only) is from the National Center for Education Statistics, 1995. *Percent Minority* (percentage of test takers) is data from the Educational Testing Service, 1995.

## V. ANALYSIS

**Table 1** shows a summary analysis of the impact of collective bargaining on student test performance on the SAT and NAEP national exams holding all other variables constant. For the SAT exams, high levels of unionization in states are positively correlated with higher tests scores adjusted for the rate of test participation. The average score for students in highly unionized states is almost 30 points higher than in states where less than 50% of the teachers are covered by collective bargaining or meet-and-confer agreements. Removal of all effects associated with collective bargaining is correlated with a reduction in the average SAT scores of 36 points in high-union states and 12 points in low-union states.

The impact of collective bargaining on average scores for the NAEP reading exam is also positive. The average reading score in highly unionized states is 217 compared to 209 in non-union states. Removal of all effects associated with collective bargaining results statistically in a drop of nine points in the average score in unionized states.

**Table 1.**

**Impact of Collective Bargaining on College Entrance Examinations And Grade 4 Reading**

| | High Level Collective Bargaining States* | Medium Level Collective Bargaining States | Non-Bargaining States |
|---|---|---|---|
| **1995 SAT (50 states)** | | | |
| Percent of teachers with: | | | |
| Collectively bargained contract | 98.0 | 63.5 | 6.1 |
| Meet-and-confer agreement | 1.6 | 21.6 | 11.6 |
| SAT Adjusted for test-taking rate | 979 | 966 | 936 |
| Average Rank | 18 | 26 | 41 |
| SAT adjusted for collective bargaining effects | 943 | 933 | 928 |
| Change in score | -36 | -35 | -8 |
| Average Rank | 21 | 28 | 32 |
| **1994 NAEP Grade 4 Reading (39 states)** | | | |
| Percent of teachers with: | | | |
| Collectively bargained contract | 98.5 | 58.1 | 6.1 |
| Meet-and-confer agreement | 1.2 | 23.3 | 11.6 |
| NAEP Grade 4 Reading | 217 | 217 | 209 |
| NAEP adjusted for collective bargaining effects | 208 | 209 | 207 |
| Change in score | -9 | -8 | -2 |

*High level of collective bargaining states have 90% or more teachers covered by collective bargaining.
Medium leve states have 50% to 89% of teachers covered and low level states have less than 50% of teachers covered.

## Table 2.

## SAT Scores in Collective Bargaining States

Adjusted for Percentage of Students Taking Tests[1]

| | Bargaining Law | Percent of Teachers Collectively Bargained Contract | Meet and Confer | Adjusted* for Test-taking Rate State SAT |
|---|---|---|---|---|
| **High Average** | | **98.0** | **1.6** | **979.3** |
| Wisconsin | x | 100.0 | 0.0 | 996.1 |
| Maryland | x | 100.0 | 0.0 | 988.5 |
| New Jersey | x | 100.0 | 0.0 | 979.1 |
| Hawaii | x | 100.0 | 0.0 | 962.9 |
| Florida | x | 100.0 | 0.0 | 949.5 |
| Rhode Island | x | 100.0 | 0.0 | 969.1 |
| Pennsylvania | x | 100.0 | 0.0 | 961.1 |
| New York | x | 99.7 | 0.0 | 972.4 |
| Massachusetts | x | 99.6 | 0.0 | 983.8 |
| Maine | x | 99.4 | 0.0 | 976.9 |
| New Hampshire | x | 99.3 | 0.0 | 1016.1 |
| Connecticut | x | 99.0 | 1.0 | 983.9 |
| Indiana | x | 99.0 | 1.0 | 956.9 |
| Oregon | x | 98.7 | 6.9 | 1012.7 |
| California | x | 98.5 | 1.4 | 956.5 |
| Alaska | x | 98.3 | 1.3 | 992.6 |
| Washington | x | 98.2 | 1.4 | 997.5 |
| Ohio | x | 98.1 | 1.5 | 962.3 |
| Iowa | x | 97.3 | 1.4 | 1000.7 |
| Michigan | x | 96.7 | 2.6 | 966.8 |
| Illinois | x | 96.4 | 2.3 | 991.1 |
| Vermont | x | 95.7 | 0.0 | 981.9 |
| Delaware | x | 95.0 | 5.0 | 977.9 |
| Nevada | x | 94.4 | 5.4 | 930.1 |
| Montana | x | 93.0 | 3.8 | 988.1 |
| Minnesota | x | 92.6 | 7.4 | 1008.1 |
| **Medium Average** | | **63.5** | **21.6** | **966.8** |
| Idaho | x | 83.0 | 13.0 | 931.6 |
| Nebraska | x | 82.3 | 15.3 | 973.1 |
| South Dakota | x | 78.9 | 25.5 | 969.7 |
| Utah | | 76.4 | 21.4 | 972.1 |
| Kansas | x | 76.4 | 21.1 | 983.1 |
| Tennessee | x | 74.7 | 3.5 | 978.2 |
| Colorado | | 69.3 | 20.3 | 989.7 |
| North Dakota | x | 66.3 | 28.1 | 1008.7 |
| Oklahoma | x | 58.4 | 13.4 | 950.1 |
| New Mexico | x | 54.5 | 11.0 | 948.3 |
| Wyoming | | 34.0 | 35.0 | 929.2 |
| Missouri | x | 7.7 | 51.6 | 968.1 |
| **Low Average** | | **6.1** | **11.6** | **936.0** |
| Kentucky | | 20.9 | 13.9 | 932.3 |
| Arkansas | | 17.3 | 11.7 | 912.2 |
| Louisiana | | 16.0 | 3.1 | 944.1 |
| Arizona | | 15.1 | 17.2 | 946.6 |
| Alabama | | 1.8 | 15.3 | 946.9 |
| Georgia | | 1.7 | 0.2 | 934.0 |
| Mississippi | | 0.0 | 8.4 | 934.1 |
| West Virginia | | 0.0 | 12.6 | 893.8 |
| Virginia | | 0.0 | 32.0 | 976.0 |
| Texas | | 0.0 | 16.0 | 951.6 |
| North Carolina | | 0.0 | 7.8 | 941.8 |
| South Carolina | | 0.0 | 1.5 | 918.9 |
| **National Average** | | **68.1** | **8.8** | **966.1** |

*Estimated SAT score if 35.4 percent of graduating seniors took the SAT (the national average) using regression coefficients from equation 3, Table 5.

[1] Unadjusted SAT scores in Table A1 in the Appendix.

**Table 2** shows the 50 states categorized by the level of teacher unionization correlated with the SAT scores adjusted for *Test Takers and Test Takers Squared.* National rankings are shown for each category. The national average for all states is an adjusted SAT score of 966 and a ranking of 25th. This table demonstrates that the states with the highest level of teacher unionization (90% or more of teachers covered by contracts) have an average adjusted SAT score of 979. States with moderate levels of collective bargaining (50%- 83%) have an average SAT score of 967. Those states with the lowest levels of teacher organization (0 - 21%) have an average score of 936.

On the following page, **Table 3** shows the statistical impact of removing effects associated with collective bargaining from the 50 states on SAT scores. States are divided into the three levels of union participation for presentation purposes. This table shows that the removal of effects associated with collective bargaining is correlated with lower scores in all states, even those with low unionization levels. In states with high levels of collective bargaining (90% +), subtracting the effects associated with collective bargaining results in a drop in the average SAT score from 979 to 943. In states with moderate levels of collective bargaining (50% - 83%), removal of collective bargaining effects is tied to a drop in the average score from 967 to 933. In states with low levels of collective bargaining or meet-and-confer participation ( 0 - 20%), removal of all collective bargaining is correlated with a drop in the average SAT score from 936 to 928.

## Table 3.

## Estimated Impact on SAT Scores of Removing Collective Bargaining Effects

| State | Percent of Teachers Collectively Bargained Contract | Meet and Confer | SAT Adjusted*For: Test Taking Rate | W/O Collective Bargaining SAT Scores | Change |
|---|---|---|---|---|---|
| **High Average** | **98.0** | **1.6** | **979.3** | **943.5** | **36** |
| Wisconsin | 100.0 | 0.0 | 996.1 | 960.4 | 36 |
| Maryland | 100.0 | 0.0 | 988.5 | 952.8 | 36 |
| New Jersey | 100.0 | 0.0 | 979.1 | 943.4 | 36 |
| Hawaii | 100.0 | 0.0 | 962.9 | 927.2 | 36 |
| Florida | 100.0 | 0.0 | 949.5 | 913.8 | 36 |
| Rhode Island | 100.0 | 0.0 | 970.0 | 933.4 | 36 |
| Pennsylvania | 100.0 | 0.0 | 961.1 | 925.4 | 36 |
| New York | 99.7 | 0.0 | 972.4 | 936.8 | 36 |
| Massachusetts | 99.6 | 0.0 | 983.8 | 948.3 | 36 |
| Maine | 99.4 | 0.0 | 976.9 | 941.4 | 35 |
| New Hampshire | 99.3 | 0.0 | 1016.1 | 980.6 | 35 |
| Connecticut | 99.0 | 1.0 | 983.9 | 948.0 | 36 |
| Indiana | 99.0 | 1.0 | 956.9 | 921.1 | 36 |
| Oregon | 98.7 | 6.9 | 1012.7 | 973.9 | 39 |
| California | 98.5 | 1.4 | 956.5 | 920.6 | 36 |
| Alaska | 98.3 | 1.3 | 992.6 | 956.8 | 36 |
| Washington | 98.2 | 1.4 | 997.5 | 961.7 | 36 |
| Ohio | 98.1 | 1.5 | 962.3 | 926.5 | 36 |
| Iowa | 97.3 | 1.4 | 1000.7 | 965.2 | 35 |
| Michigan | 96.7 | 2.6 | 966.3 | 930.4 | 36 |
| Illinois | 96.4 | 2.3 | 991.1 | 955.5 | 36 |
| Vermont | 95.7 | 0.0 | 981.9 | 947.7 | 34 |
| Delaware | 95.0 | 5.0 | 977.9 | 941.3 | 37 |
| Nevada | 94.4 | 5.4 | 930.1 | 893.6 | 37 |
| Montana | 93.0 | 3.8 | 988.1 | 952.9 | 35 |
| Minnesota | 92.6 | 7.4 | 1008.1 | 971.1 | 37 |
| **Medium Average** | **63.5** | **21.6** | **966.8** | **932.8** | **34** |
| Idaho | 83.0 | 13.0 | 931.6 | 895.1 | 36 |
| Nebraska | 82.3 | 15.3 | 973.1 | 935.6 | 37 |
| South Dakota | 78.9 | 25.5 | 969.7 | 928.1 | 42 |
| Utah | 76.4 | 21.4 | 972.1 | 933.6 | 39 |
| Kansas | 76.4 | 21.1 | 983.1 | 944.7 | 38 |
| Tennessee | 74.7 | 3.5 | 978.2 | 949.7 | 29 |
| Colorado | 69.3 | 20.3 | 989.7 | 954.2 | 35 |
| North Dakota | 66.3 | 28.1 | 1008.7 | 970.2 | 39 |
| Oklahoma | 58.4 | 13.4 | 950.1 | 922.2 | 28 |
| New Mexico | 54.5 | 11.0 | 948.3 | 923.0 | 25 |
| Wyoming | 34.0 | 35.0 | 929.2 | 898.6 | 31 |
| Missouri | 7.7 | 51.6 | 968.1 | 938.1 | 30 |
| **Low Average** | **6.1** | **11.6** | **936.0** | **927.7** | **8** |
| Kentucky | 20.9 | 13.9 | 932.3 | 917.5 | 15 |
| Arkansas | 17.3 | 11.7 | 912.2 | 899.8 | 12 |
| Louisiana | 16.0 | 3.1 | 944.1 | 936.7 | 7 |
| Arizona | 15.1 | 17.2 | 946.6 | 932.1 | 14 |
| Alabama | 1.8 | 15.3 | 946.9 | 938.2 | 9 |
| Georgia | 1.7 | 0.2 | 934.0 | 933.3 | 1 |
| Mississippi | 0.0 | 8.4 | 934.1 | 929.7 | 4 |
| West Virginia | 0.0 | 12.6 | 893.8 | 887.2 | 7 |
| Virginia | 0.0 | 32.0 | 976.0 | 959.1 | 17 |
| Texas | 0.0 | 16.0 | 951.6 | 943.2 | 8 |
| North Carolina | 0.0 | 7.8 | 941.8 | 937.7 | 4 |
| South Carolina | 0.0 | 1.5 | 918.9 | 918.2 | 1 |
| **National Avg.** | **68.1** | **8.8** | **966.1** | **937.2** | |

*Effect of bargaining rights based on collective bargaining and meet-and-confer coefficients in equation 3 in Table A1 in the Appendix. Bargaining rights adjustments is applied SAT scores adjusted for the number of test takers. See Table 2.

On the next page, **Table 4** shows the NAEP test results for 39 states grouped in levels of teacher participation in collective bargaining and the statistical impact of removing collective bargaining on NAEP scores in those states. Thirteen states did not participate in the grade four reading tests. This table demonstrates that the states with the highest level of teacher unionization (90% +) have an average adjusted NAEP score of 217. States with moderate levels of collective bargaining (50%- 83%) have an average NAEP score of 217 and those states with the lowest levels of teacher organization (0 - 21%) have an average score of 209. The national average for all states is a NAEP score of 214.

This table also indicates that the removal of effects associated with bargaining is correlated with lower scores in all states, even those with low unionization levels. In states with high levels of collective bargaining (90%+), the elimination of collective bargaining is correlated with a drop in the average SAT score from 217 to 208. In states with moderate levels of collective bargaining (50% - 83%), removal of unionization is correlated with a drop in the average score from 217 to 209. In states with low levels of collective bargaining or meet-and-confer participation (0 - 20%), removal of all collective bargaining effects results in a statistical drop in the average NAEP score from 209 to 207. The national average for all students without collective bargaining drops statistically from 214 to 208.

**Regression Analysis**

Thus far, we have adjusted average test scores for the effect of collective bargaining on school performance. The impact of collective bargaining indicated in the preceding tables takes into account other factors impacting school performance such as household income, class size, urbanization and region by using regression analysis. The regression analysis tables below describe the additional impact of these variables.

There are two models in this regression analysis: the first is one without collective bargaining, which looks solely at background factors; the second model includes collective bargaining and the set of factors. To understand how variables interact, no one factor can be analyzed alone. It is necessary to control for other variables through a numerical weighting process.

**Table 4.**

## NAEP Scores and the Impact of Removing Collective Bargaining*

| State | Percent of Teachers: Collective Bargaining Contract | Percent of Teachers: Meet and Confer Agreement | NAEP Grade 4 Reading | W/O Collective Bargaining NAEP Grade 4 Reading | Change |
|---|---|---|---|---|---|
| **High Average** | **98.5** | **1.2** | **216.8** | **208.0** | **- 9.3** |
| Wisconsin | 100.0 | 0.0 | 225.0 | 216.0 | - 9.0 |
| Rhode Island | 100.0 | 0.0 | 221.0 | 212.0 | - 9.0 |
| New Jersey | 100.0 | 0.0 | 220.0 | 211.0 | - 9.0 |
| Pennsylvania | 100.0 | 0.0 | 216.0 | 209.0 | - 9.0 |
| Maryland | 100.0 | 0.0 | 211.0 | 202.0 | - 9.0 |
| Florida | 100.0 | 0.0 | 206.0 | 197.0 | - 9.0 |
| Hawaii | 100.0 | 0.0 | 202.0 | 193.0 | - 9.0 |
| New York | 99.7 | 0.0 | 213.0 | 204.0 | - 9.0 |
| Massachusetts | 99.6 | 0.0 | 224.0 | 215.0 | - 9.0 |
| Maine | 99.4 | 0.0 | 229.0 | 220.0 | - 9.0 |
| New Hampshire | 99.3 | 0.0 | 224.0 | 215.0 | - 9.0 |
| Connecticut | 99.0 | 1.0 | 223.0 | 214.0 | - 9.0 |
| Indiana | 99.0 | 1.0 | 221.0 | 212.0 | - 9.0 |
| California | 98.5 | 1.4 | 198.0 | 191.0 | - 9.0 |
| Washington | 98.2 | 1.4 | 214.0 | 205.0 | - 9.0 |
| Iowa | 97.3 | 1.4 | 224.0 | 215.0 | - 9.0 |
| Delaware | 95.0 | 5.0 | 207.0 | 197.0 | -10.0 |
| Montana | 93.0 | 3.8 | 223.0 | 214.0 | - 9.0 |
| Minnesota | 92.6 | 7.4 | 219.0 | 209.0 | -10.0 |
| **Medium Average** | **58.2** | **23.3** | **217.4** | **209.0** | **- 8.3** |
| Nebraska | 82.3 | 15.3 | 221.0 | 211.0 | -10.0 |
| Utah | 76.4 | 21.4 | 218.0 | 208.0 | -10.0 |
| Tennessee | 74.7 | 3.5 | 214.0 | 207.0 | - 7.0 |
| Colorado | 69.3 | 20.3 | 214.0 | 205.0 | - 9.0 |
| North Dakota | 66.3 | 28.1 | 226.0 | 216.0 | -10.0 |
| New Mexico | 54.5 | 11.0 | 206.0 | 200.0 | - 6.0 |
| Wyoming | 34.0 | 35.0 | 222.0 | 214.0 | - 8.0 |
| Missouri | 7.7 | 51.6 | 218.0 | 211.0 | - 7.0 |
| **Low Average** | **6.1** | **11.6** | **209.1** | **207.0** | **- 2.0** |
| Kentucky | 20.9 | 13.9 | 213.0 | 209.0 | - 4.0 |
| Arkansas | 17.3 | 11.7 | 210.0 | 207.0 | - 3.0 |
| Louisiana | 16.0 | 3.1 | 198.0 | 196.0 | - 2.0 |
| Arizona | 15.1 | 17.2 | 207.0 | 203.0 | - 4.0 |
| Alabama | 1.6 | 15.3 | 209.0 | 207.0 | - 2.0 |
| Georgia | 1.7 | 0.2 | 208.0 | 208.0 | - 0.0 |
| North Carolina | 0.0 | 7.8 | 215.0 | 214.0 | - 1.0 |
| West Virginia | 0.0 | 12.6 | 214.0 | 212.0 | - 2.0 |
| Virginia | 0.0 | 32.0 | 214.0 | 210.0 | - 4.0 |
| Texas | 0.0 | 16.0 | 213.0 | 211.0 | - 2.0 |
| South Carolina | 0.0 | 1.5 | 205.0 | 205.0 | - 0.0 |
| Mississippi | 0.0 | 8.4 | 203.0 | 202.0 | - 1.0 |
| **National Avg.** | **61.0** | **9.0** | **214.0** | **208.0** | **- 6.8** |

*States not included in this study are: Alaska, Idaho, Illinois, Kansas, Michigan, Nevada, Ohio, Oklahoma, Oregon, South Dakota and Vermont because they did not participate in NAEP.

**Table 5** shows results from regression models for the SAT test scores using demographic, fiscal and union variables. The percentage of test takers participating is statistically significant at the 5% level in both models, that the percentage of minority students is statistically significant in model 1 at the 5% level, and collective bargaining is statistically significant at the 5% level in model 2. Income, per-pupil education spending, percent of graduates from private high schools, and the regional impact of southern states did not show a statistically significant effect on test scores in the analysis including unionization. In equation 1, where unionization is omitted, percent minority had a larger and statistically significant effect on test scores. Income had a somewhat larger effect and was weakly significant at the .15 level in the equation without unionization effect. Both higher minority student populations and income are moderately correlated with unionization.

**Table 5.**

**Regression Models of State SAT Scores (Verbal and Math Combined) on Demographic, Fiscal and Union Variables**

(All T values are in parentheses)

| | Mean | [1] | [2] | [3] |
|---|---|---|---|---|
| SAT (Math& Verbal) | 986 | | | |
| Test Takers | 35.2% | - 6.53* (8.96) | - 6.016* (8.36) | - 5.944* (8.62) |
| Test Takers Squared | 1940 | 0.0525* (5.67) | 0.04332* (4.511) | 0.0424* (4.68) |
| Percent Urban | 68.1% | | 0.16 (0.453) | - 0.278 (0.784) |
| Private H.S. Grads | 9.5% | | 0.437 (0.515) | 0.588 (0.706) |
| Spending Per Pupil | $ 5,309 | | 0.0025 (0.58) | - 0.0005 (0.12) |
| Income Per Capita | $20,958 | | 0.0039 (1.52) | 0.0023 (0.925) |
| Percent Minority | 20.5% | | - 1.204* (2.59) | - 0.23 (0.44) |
| Collective Bargaining | 56.8% | | | 0.357* (1.96) |
| Meet-and-Confer Only | 8.9% | | | 0.528 (1.09) |
| South (1=yes) | | | | - 9.61 (0.76) |
| Constant | | 1094 | 1007 | 1038 |
| N | | 50 | 50 | 50 |
| Adjusted R-Squared | | 0.87 | 0.901 | 0.92 |

*Significant at 5% level

On the following page, the regression models for the NAEP test scores using demographic, fiscal and union variables show somewhat different results in **Table 6** but the correlation between unionization and higher test results is clear. The differences in results are not surprising since the NAEP test measures the achievement of all 4th grade students, not just the college bound. In this analysis, the percent of students in the states graduating from private schools is negatively correlated with high test scores. The larger the number of students in private schools, the poorer the test scores. This result is statistically significant at the 5% level. In bivariate analysis, income per capita in the state is positively related to higher test scores via other variables in the regression model. Percent of minority students is also negatively correlated with higher test scores at a significant level without collective bargaining. When collective bargaining is factored in, minority fades to insignificance. High absence rates in a state is correlated with lower test scores at a significant level. The percentage of children in classes of less than 25 is correlated with higher test scores at a statistically significant level. Collective bargaining is also significant with higher levels of collective bargaining associated with higher test scores. (See Table A2 in the Appendix.)

**Results Considering All Evidence, SAT and NAEP**

Taking into account evidence from the NAEP 4th Grade reading test and the more limited SAT college boards, there is strong evidence that there is a positive relationship between collective bargaining and higher scores in both the SAT and NAEP tests. Income is a significant factor for the SAT scores. For the NAEP reading scores, low income, large class size, high absence rates, minority enrollment, and **the level of private school attendance** are correlated with low performance levels at the state level.

Data indicates that states with collective bargaining have SAT scores, adjusted for the percentage of high school test takers, almost 40 points **higher** than the states with minimal collective bargaining or meet-and-confer rights and the statistical impact of removing collective bargaining is a drop in state performance levels of 35 points in the average state score. The same results are demonstrated for the NAEP test where states with high levels of collective bargaining show test results nine points higher than states with low levels of collective bargaining. The removal of all collective bargaining from all states is associated with a seven point drop in scores for all fourth grade students.

**Table 6.**

**Regression Models of State Grade 4 Public School NAEP Reading "Scores On Demographic, Fiscal and Union Variables"**
(All T values are in parentheses.)

| | Mean | [1] | [2] |
|---|---|---|---|
| Grade 4 NAEP Reading | 214.5 | | |
| Percent Urban | 68.6% | 0.019<br>(0.259) | - 0.04<br>(0.56) |
| Private H.S. Grads | 10.2% | - 0.435*<br>(2.83) | - 0.466*<br>(3.23) |
| Spending Per Pupil | $5,253 | 0<br>(0.024) | - 0.001<br>(0.641) |
| Income Per Capita | $20,921 | 0.001*<br>(2.45) | 0.001<br>(1.85) |
| Percent Minority | 21.7% | - 0.373*<br>(4.25) | - 0.136<br>(1.27) |
| Percent IEP or LEP | 14.2% | 0.271<br>(1.37) | 0.026<br>(0.137) |
| High Absence Rate | 15.0% | - 0.356*<br>(2.87) | - 0.271*<br>(2.4) |
| Class Size Under 25 | 66.6% | 0.147 *<br>(3.12) | 0.202*<br>(4.34) |
| Collective Bargaining | 56.7% | | 0.0933*<br>(3.2) |
| Meet-and-Confer Only | 8.9% | | 0.125<br>(1.75) |
| Constant | | 194.3 | 195.4 |
| N | | 38 | 38 |
| Adjusted R-Squared | | 0.76 | 0.815 |

*Significant at 5% level

## VI. CONCLUSION

The data generated in this study demonstrate that collective bargaining is not responsible for poor student performance. In fact, in states with high levels of teacher unionization, student scores on standardized tests are higher than in states with low levels of teacher participation in collective bargaining or meet-and-confer activities. There are many possible explanations for the higher scores obtained in states with unionized schools. Through negotiations, unionized teachers have more leverage over conditions that impact school performance such as class size, academic resources, teacher training, academic and social support services than non-union educators. In addition, higher wages and benefits, as well as negotiated grievance procedures obtained through unionization, create a work environment that encourages teacher stability and commitment, essential characteristics of an effective school.

Socio-economic factors such as low household income, large class size, high rates of absenteeism, higher percentages of minority students and larger numbers of persons graduating from private schools are significantly correlated with lower test scores. After controlling for these variables, the impact of unionization changes little.

In short:

- Collective bargaining is not a destructive force in public education. Students have higher test scores in unionized states.
- Contrary to the claim of privatization advocates, there is no evidence that increased competition from private schools improves public school performance.
- Socio-economic factors are the crucial factors in determining student performance.
- Class size matters. Smaller classes are correlated with improved test performance.

Public education faces a number of serious problems that do impact children's education and performance. Efforts by teachers to organize for decent wages and working condition standards is not one of them. Poverty rates among children continue to rise across the country. Social and financial instability contributes to high rates of mobility and disorganization, particularly among low-income households. Federal and state budget cuts have led to a reduction in resources for school hiring, teacher training, and educational resources resulting in larger class size with inadequate

programming in many schools. Often, social and economic deprivation lead to increased learning disabilities and behavior problems which compound the difficulties encountered in more crowded classrooms and schools.

The criticisms leveled at teachers' unions are generally tied to an overall negative assessment of public education and proposals to privatize education. These advocates claim that privatized education will improve student performance by "breaking the educational monopoly of public schools and teachers' unions." Data from this study demonstrates that "breaking the unions" will hurt, not help, student performance. The issues that must be faced and dealt with are more fundamental. The public school system is a crucial institution established to educate children from numerous and diverse communities. To provide a quality education for these children requires the school system to adapt and respond effectively to pervasive and difficult social conditions. Fragmenting the system, reducing resources and jeopardizing the stability of the teaching staff will not further this goal.

## VII. APPENDIX Table A1.

### SAT Scores in Collective Bargaining States

| State | SAT | Percent Of Seniors | Adjusted* for Test-taking Rate Taking SAT |
|---|---|---|---|
| **High Average** | **943.5** | **48.4** | **979.3** |
| Wisconsin | 1073 | 9 | 996.1 |
| Maryland | 909 | 64 | 988.5 |
| New Jersey | 898 | 70 | 979.1 |
| Hawaii | 889 | 57 | 962.9 |
| Florida | 889 | 48 | 949.5 |
| Rhode Island | 888 | 70 | 969.1 |
| Pennsylvania | 880 | 70 | 961.1 |
| New York | 892 | 74 | 972.4 |
| Massachusetts | 907 | 80 | 983.8 |
| Maine | 896 | 68 | 976.9 |
| New Hampshire | 935 | 70 | 1016.1 |
| Connecticut | 908 | 81 | 983.9 |
| Indiana | 882 | 58 | 956.9 |
| Oregon | 947 | 51 | 1012.7 |
| California | 902 | 45 | 956.5 |
| Alaska | 934 | 47 | 992.6 |
| Washington | 937 | 48 | 997.5 |
| Ohio | 975 | 23 | 962.3 |
| Iowa | 1099 | 5 | 1000.7 |
| Michigan | 1033 | 11 | 966.3 |
| Illinois | 1048 | 13 | 991.1 |
| Vermont | 901 | 68 | 981.9 |
| Delaware | 897 | 68 | 977.9 |
| Nevada | 917 | 30 | 930.1 |
| Montana | 1009 | 21 | 988.1 |
| Minnesota | 1085 | 9 | 1008.1 |
| **Medium Average** | **1037.3** | **10.6** | **966.8** |
| Idaho | 979 | 15 | 931.6 |
| Nebraska | 1050 | 9 | 973.1 |
| South Dakota | 1068 | 5 | 969.7 |
| Utah | 1076 | 4 | 972.1 |
| Kansas | 1060 | 9 | 983.1 |
| Tennessee | 1040 | 12 | 978.2 |
| Colorado | 980 | 29 | 989.7 |
| North Dakota | 1107 | 5 | 1008.7 |
| Oklahoma | 1027 | 9 | 950.1 |
| New Mexico | 1015 | 11 | 948.3 |
| Wyoming | 1001 | 10 | 929.2 |
| Missouri | 1045 | 9 | 968.1 |
| **Low Average** | **943.3** | **31.4** | **936.0** |
| Kentucky | 999 | 11 | 932.3 |
| Arkansas | 1005 | 6 | 912.2 |
| Louisiana | 1021 | 9 | 944.1 |
| Arizona | 944 | 27 | 946.6 |
| Alabama | 1029 | 8 | 946.9 |
| Georgia | 854 | 65 | 934.0 |
| Mississippi | 1038 | 4 | 934.1 |
| West Virginia | 932 | 17 | 893.8 |
| Virginia | 896 | 65 | 976.0 |
| Texas | 893 | 47 | 951.6 |
| North Carolina | 865 | 60 | 941.8 |
| South Carolina | 844 | 58 | 918.9 |
| **National Average** | **966.1** | **35.3** | **966.1** |

*Estimated SAT score if 35.4 percent of graduating seniors took the SAT (the national average) using regression coefficients from equation 3, Table 5.

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