DOCUMENT RESUME

ED 368 056 EA 025 685

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TITLE Predictions: From Public School Teacher Salaries to Student Outcomes.
PUB DATE May 93
NOTE 41p.
PUB TYPE Reports - Research/Technical (143) -- Viewpoints (Opinion/Position Papers, Essays, etc.) (120)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; *Budgets; Educational Change; Elementary Secondary Education; *Financial Support; *Outcomes of Education; Public Schools; *Public School Teachers; State Aid; Taxes; Teacher Improvement; *Teacher Salaries
IDENTIFIERS *Rhode Island

ABSTRACT

A study of 28 school districts in Rhode Island was done in 1992 to examine the hypothesis that there is a positive correlation between teacher salaries and state aid. The study was originally designed to gather information about teacher salaries and the variables related to them, but was expanded to cover student outcomes and variables related to student performance. With the final data, correlations were drawn to design predictive equations for Rhode Island's educational system. The study reveals that a child's socioeconomic background affects a child's educational performance. Thus, there should be school intervention programs designed to address student's socioeconomic needs. The study fails to find a correlation between increased educational spending and student achievement. The study recommends that 60 percent of educational funding come from the state, and that teacher salaries remain competitive to attract the most qualified teachers. Public policy should focus on five areas: (1) meeting the social, economic, and emotional needs of students; (2) redesigning school organization to achieve desired student outcomes; (3) reshaping and strengthening the professional development system for teachers and administrators; (4) increasing cooperation among school districts; and (5) developing a funding strategy to consistently finance the educational system. The appendix presents the data in five spreadsheets, four tables, and five figures. (Contains 80 references.) (KDP)

PREDICTIONS:

FROM PUBLIC SCHOOL TEACHER SALARIES

TO

STUDENT OUTCOMES

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CONTENTS

Introduction

Both authors have been involved in collective bargaining for public sector educators in Rhode Island and have been motivated by the theory that "the quality of the teaching staff is the single most important element in determining the level of learning."[1]

While negotiating for public school teachers, inevitably the other side brings up the lack of money as a reason for not being able to increase salaries. It seemed logical to look at where and how schools get their funding. In Rhode Island education dollars come from three sources: federal, state and local. The original hypothesis centered around the state/local contribution to education. The authors decided to assess the problems with the current funding formula in Rhode Island to see if there was an alternative which would provide a more equitable funding distribution and what the alternative's impact would be on teacher salaries.

There is a huge collection of information addressing the funding of education. The information ranges from basic economic and philosophical theory to actual case studies dealing with funding inequalities and the variety of issues inherent to educational funding. Upon a review of the literature it became apparent that the intended scope of this study would have to be altered.

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[1] K. Alexander & D. H. Monk. (1987). Attracting and Compensating America's Teachers. Cambridge: Ballinger Publishing Company, p. XIX.

This resulted in the narrowing of the hypothesis to see if levels of state aid within a community affected teacher salaries. The authors hypothesized that there would be a positive correlation between teacher salaries and state aid — the higher the level of state aid to a community the higher that community's teacher salaries would be. The data which could support this hypothesis was examined. Ultimately, the search was broadened to include not only state aid, but other community characteristics to see if there was correlation to Rhode Island teacher salaries.

Salary scales are public information, and as such are easily determined by prospective teachers, taxpayers, and other interested parties. The current wage is of less interest than some indicators inherent in all communities which might signal future wages for teachers here in Rhode Island

There are many reasons for union leaders and personnel managers to be interested in being able to predict future salary levels. One may be to provide salary information to those looking for employment as teachers. Another, concerns those involved in negotiating teacher salaries who could benefit from being able to accurately assess a community's ability to pay and to gather data for community comparisons. Still another, one most commonly seen in the media these days, revolves around the ongoing fight which occurs each spring as school districts present their budget requests for the upcoming school year. Inevitably, the budgets contain increases, a large

portion of which is contractually mandated for teacher salaries and other teacher compensation. One more stems from the multitude of reports which have been published commenting on the ills and failures of the United States educational system and the implications of these social policy concerns.

These same reports have also suggested a multitude of recommendations for improving student outcomes. In fact, in 1991 Rhode Island Governor Bruce Sundlun created the 21st Century Education Commission to assess "the social, economic, and structural issues confronting Rhode Island education in the remainder of the 1990s and into the next century."[2] Because teachers are an integral component of the reforms being advocated, both nationally and in Rhode Island, intuitively it follows that their salaries will be affected when reforms are implemented.

A Brief History of Education Reform

During the 1980s it became unmistakably clear that the educational system in the United States was failing to meet the needs of many children — to provide them with the academic skills to match foreign students' test scores, and develop into caring, productive citizens able to succeed in a global economy. Concern over this failure persuaded governors and state legislators to finally embrace the goal of

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[2] 21st Century Education Commission. (1992). Educating All Our Children. The Report of the 21st Century Education Commission . coverletter.

excellence. The only problem is that possessing concern does not guarantee achievement of the desired result.[3]

The early, 1970s - mid 1980s, recommendations centered around student expectations, high school graduation requirements, the school day and problems in funding education.[4] The reports agreed that teachers were critically important and should be better prepared, but improvement of the teaching force was not the major focus.[5] Around this time attention focused on the inequality of school finance funding formulas. Legal challenges to the state-local funding systems were initiated in response to allegations that heavy reliance on the local property tax was producing fiscal inequalities and large disparities of per pupil expenditures between poor and wealthy school districts. The result was due to the fact that property tax bases were not distributed equally among school districts. The tax base of districts varies, as does the citizens' ability to pay tax levies.

This onslaught of legal challenges effected changes in over two-thirds of the school aid funding programs in the United States, between 1971 and 1985, with the following results:

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[3] J. Green. (1986). What Next? More Leverage for Teachers. Denver: Education Commission of the States, p. 1.

[4] K. Alexander & D. H. Monk. (1987). Attracting and Compensating America's Teachers. Cambridge: Ballinger Publishing Company, p. 21.

[5] Ibid. p. 21.

- The states' share of education funding increased from 39% to nearly 50%.
- Real, inflation-adjusted, average per pupil expenditures grew by 45%.
- Many states revised their school finance systems in a way that more equitably distributed state aid.[6]

Later reports tended "to focus on changes in teacher education programs, higher teacher pay, and improved working conditions for teachers"[7] as crucial to the school reform efforts. The Rhode Island report from the 21st Century Education Commission deals with all these issues, although some more directly than others. The Commission also moved outside of the traditional areas of investigation and linked education with the health, social and emotional needs of children — the child's total environment.[8]

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[6] Educational Testing Service. (1991). The State of Inequality . Princeton: Policy Information Center. p. 7.

[7] K. Alexander & D. H. Monk. (1987). Attracting and Compensating America's Teachers. Cambridge: Ballinger Publishing Company, p. 22

[8] 21st Century Education Commission. (1992). Educating All Our Children. The Report of the 21st Century Education Commission. p. IV-7.

Compilation of Data, Tables, Graphs, and Equations

The four page spread sheet (Appendix A: Spreadsheet 1-a, 1-b, 1-c, and 1-d) was compiled from three primary data sources. Information with respect to teacher salaries was provided by the National Education Association of Rhode Island. The 1990 Census provided the data for: median family income; total household population; percent of family households with children under 18 years of age; and the number of households with people age 65+. The Rhode Island Department of Education provided data through two documents. Statistical Tables for 1989-90 provided the information for total resident expenditures, local contributions, and state contributions. Rhode Island Public Schools Education Indicators 1990 provided the raw data regarding MATs, SATs, attendance rates, and graduation rates. All data used was for the 1989-1990 school year (1990 fiscal year)

Additionally, the Office of Municipal Affairs of the Rhode Island Department of Administration's Annual Report on Local Government Finances and Tax Equalization provided information used to compute the equalized weighted assessed valuation for cities and towns in Rhode Island. This information was not included in the final spreadsheet, but did serve a valuable purpose in helping to critique the various school funding proposals found in the literature.

Two important questions were considered when the database was assembled: What communities would be included? What relationships were the authors interested in examining?

Of the thirty nine communities throughout the state, only communities with school districts with their own taxing authority and with a full kindergarten through twelfth grade system where evaluated. This eliminated the towns in the state's three regionalized school districts — Charlestown, Exeter, Foster, Glocester, Hopkinton, Richmond, and West Greenwich — and Jamestown and Little Compton where high school students attend school out of town. This left 30 school districts for use in most correlations. However, as noted in Appendix A: Table 2, two communities (New Shoreham and Scituate) had to be eliminated from the correlations dealing with Census derived data since that information was not available. The resulting twenty eight formed the database for the eventual regression equation that was produced.

Teacher salaries and variables thought to affect them were of initial interest, though as stated earlier, the focus expanded to student outcomes and variables correlated to student performance. Of some interest was whether union affiliation might have a predictable effect on salaries. In Rhode Island public school teachers are represented by the American Federation of Teachers, AFL-CIO (AFT) or the National Education Association (NEA). The AFT locals are located, primarily, in city school districts and NEA locals are in the rural and suburban districts.

The variables ultimately used are as follows:

Dependent Variable:

Teacher Salary — 1989-90 top step

Independent Variables:

Tax Dollar Characteristics

State/Total Aid Contribution

Percent of Local Taxes Paid for Education
(vs. municipal expenditures)

Family/Household Characteristics

Median Family Income

Total Household Population

Percent of Family Households with Children Under 18

Percent of Households with Persons 65 Years of Age and Older

Bargaining Unit Characteristics

Affiliation of the Bargaining Unit

Percent Males-Females in the Bargaining Unit

Educational Outcome Characteristics

Score on Metropolitan Achievement Tests (MATs) - Grade 8

Graduation Rate

Attendance Rate

SAT Scores

Total Educational Outcomes (adjusted rank)

The spreadsheet (Appendix A: Spreadsheet 1-a,1-b, 1-c, and 1-d) was generated using Lotus 1-2-3. The data was sorted in various ways and then transformed into a useable format. This was particularly useful when looking at, for example, all student outcomes (Appendix A: Table 1-a and Table 1-b). It was necessary to rank each individual outcome; sum the ranks; and then rank the total sum. Because the outcomes are reported in different formats — percents and national percentiles — ranking allowed the data to be equalized.

The final step involved use of a statistical package, KWIKSTAT, to determine the Pearson's and Spearman's correlation coefficients and to generate prediction equations.

Results

Salaries varied from a high of $38,035 in Westerly to a low of $34,459 in Warren. The mean for teacher salaries was $36,544 and the median was $36,685 (Appendix A: Figure 1). Initially looking at the state aid to local aid ratio, the expectation was to see higher teacher salaries in communities that paid proportionally less from local tax revenues. What was found was a negative correlation, p (rho) = - .43. In fact, three of the variables examined — state/total, Households with Children under 18, and Total Household Population — showed a correlation to teacher salary greater than p = ± 0.2 (Appendix A: Table 2 and Figure 2, 3, and 4,).

Two regression equations were generated and each was used to make two predictions (even though the predicted Y value was known). One equation (Table 3) used only two variables, state/total expenditure ratios and the total household population. The equation predicted a salary of $37,883 for Providence and $37,114 for Westerly. The second equation (Table 4) used a third variable, percent of household with children under 18. That equation predicted a salary of $37,666 for Providence and $37,068 for Westerly. The actual values are $37,385 for Providence and $38,035 for Westerly.

If these equations had been produced from a random sample of a population, the first equation would most likely be used since it has an F value of 11.8 and the second equation has an F value of 8.5. The first regression with two independent variables has a $R^2 = 0.4865$ which means that nearly half of the variance associated with the dependent variable can be associated with the independent variables.

Although the equation with three independent variables has a slightly greater R^2 value ($R^2 = 0.5159$), this would be expected since the addition of another variable simply increases the amount of variability that is "accounted" for by its mere inclusion — thus showing the relative weakness of this last variable in the regression equation.

A number of other variables proved to be weakly correlated with teacher salaries. The ranked ratio of the local property tax used for education with the ranked teacher salaries showed a $p = -0.046$. A similar correlation for student outcomes and teacher salaries produced

a p = - 0.040. The correlation of percent males/females in the bargaining unit was also found to be low, p = 0.029. Finally, the correlation between median family income in the community and teacher salaries in that community was found to be only p = 0.185 with a population of 30 communities. But there was a strong correlation — as might be expected — between Median Family Income vs. Total Educational Outcomes (by rank), R = .851 (Appendix A: Table 2 and Figure 5).

Review of salaries by union affiliation showed that AFT locals enjoyed a nearly $500 increase over the mean of NEA locals, although the variance among the AFT locals was greater, $803 and $904 for the standard deviations respectively. The reasons for the difference between the means are at least partially reflected by the three variables found to be moderately correlated with teacher salaries, i. e. state/total expenditure ratios, the total household population, and the percent of families with children under 18. The greater militant image of the Federation[9], although not measurable, may indeed play a role in larger teacher salaries. A time series analysis would shed more light on the entire subject of teacher salaries and bargaining unit history.

[9] C. T. Kerchner & D. E. Mitchell. (1988). The Changing Idea of a Teachers' Union. Philadelphia: The Falmer Press.

Discussion and Recommendations

One must remember that this research covers a one year period, the 1989-1990 school year, only. A time-series study of the data would be a logical and useful continuation of this research and would aid in determining whether this particular study's findings would be applicable over the long run. A time-series would also assist in determining whether it would be possible to accurately predict levels of teacher salaries and student outcome achievement, as well as other factors which might be of interest to educators, administrators, and public policy makers.

This study's finding regarding a community's socio-economic status and student outcomes appears to support the 21st Century Education Commission's strategy to approach education in terms of the needs of the whole child[10]. Are children succeeding in school as a function of their socio-economic background? The results seem to indicate that, at the least, the combined socio-economic background of the community in which children are being educated has some relation to the educational outcomes. Altering learning expectations, altering the organization and governance of the schools, developing a stronger system of professional development, enhancing collaboration among school districts are ideas advanced for the purpose of attaining "higher" outcomes. Providing adequate and equitable funding is also

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[10] 21st Century Education Commission. (1992). Educating All Our Children. The Report of the 21st Century Education Commission. p. III-1.

a major part of school reform put forward as part of the total package of achieving the goal of excellence.[11] The achievement of successful learning outcomes is highly correlated with characteristics and traits associated with a community's median family income. The authors' research begs the question of why?

A thorough investigation of household activity as it relates to individual household income and household educational outcomes is clearly needed before social policy decisions can be made on strategies for intervention. The literature suggests that programs such as Head Start may at least initially alter the possible negative effects of socio-economic constraints. Early intervention program such as Head Start rely on parental interest and involvement. Perhaps a strategy to increase parental interest in educational outcomes for students already in school would result in increased student achievement. A social policy involving parental education regarding the implications of such a program could be explored.

Successful reform of Rhode Island's education system will require more than shifting of money from the property tax to the state income tax, although this is recognized a very important in terms of taxpayer equity and per pupil expenditures.[12] The 21st Century Education Commission Report recommended that the state fund at least 60% of

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[11] Ibid. p. IV-1.

[12] P. E. Burrup, P. E., & Vern Brimley, Jr. (1982). Financing Education in a Climate of Change (3rd ed.). Boston: Allyn and Bacon, Inc. p. 407.

the cost of education and that ultimately a Guaranteed Student Entitlement program, which would consider median family income and equalized assessed property values in determining the local school tax levy. The authors feel that this is a viable approach, but have concerns over the use of median family income. If there were a way to annually determine a community's median family income, rather than rely on the decennial census, the authors would feel more comfortable with this recommendation.

While research does not demonstrate any firm linkage between increased education spending and student achievement, the availability of remedial assistance, social services, and other student assistance programs can influence the achievement of students.[13] If student outcomes are to be the bench mark for determining the success of Rhode Island's educational system[14], then intervention must be designed to address the social and economic needs of children.

If a community's socio-economic background is the main predictor of educational outcomes for students, what can be done within the schools to mitigate its influence? From a bargaining perspective, it may well be a waste of time and effort to expect that simply increasing salaries will change student outcomes, but to not

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[13] A. Odden. (June 1991). School Finance in the 1990s . Los Angeles: University of Southern California Center for Research in Education Finance. p. 2.

[14] 21st Century Education Commission. (1992). Educating All Our Children. The Report of the 21st Century Education Commission. p. VI-16.

provide students with a quality teaching staff (enticed into the profession with professional salaries) — as suggested by Alexander and Monk, Green, and Reyes — would be an egregious mistake. Research appears to indicate that maintaining a professional, quality teaching corps is "the single most important element in determining the level of learning." [15].

What then contributes to a professional, quality teaching staff? The literature suggests: requiring high teaching standards; providing salaries commensurate with the duties and responsibilities of the profession; and maintaining a system of ongoing professional development to provide state of the art knowledge in teaching. Since this study's hypothesis originally centered around teacher salaries, the authors would concur with that, as well as the other components set forth. Teacher salaries must be kept at a professional level in order to attract the most qualified, dedicated, and motivated college graduates and professionals who may enter the profession later (from a career change).

Although the results of this study do not appear to show any one variable that would be adequate to argue for a pay adjustment, it does show the interrelationships of many of the variables we examined. For this reason public policy cannot address the inadequacies of the educational system in a piecemeal fashion. Its approach must:

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[15] K. Alexander & D. H. Monk. (1987). Attracting and Compensating America's Teachers. Cambridge: Ballinger Publishing Company, p. XIX.

- Meet the social, economic and emotional needs of students and potential students. They must be ready to learn when they enter school.
- Redesign school organization and governance to achieve desired student outcomes.
- Reshape and strengthen the professional development system for teachers and administrators.
- Increase cooperation among school districts to increase efficiency and productivity.
- Develop a funding strategy to adequately and consistently finance the educational system.

Appendix A:

Contents

Spreadsheet 1-a

Community	PRIMARY 1989-90 Teacher Salary 1	PRIMARY Median Family Income 2	Percent Statewide Med Income 3	Ranking Median Family 4	PRIMARY Total Resident Expenditure 5	PRIMARY Local Contribution 6	PRIMARY State Contribution 7	Local/ Total Ratio 8	State/ Total Ratio 9	PRIMARY % Property Tax Dollar For Schools 10
Westerly	$38,035	$41,420	105.74	16	$16,552,627	$12,351,858	$4,101,686	0.75	0.25	63
Coventry	$37,600	$41,883	106.92	15	$24,432,150	$11,223,008	$12,838,733	0.46	0.53	72
Warwick	$37,511	$42,122	107.53	12	$70,497,132	$44,323,136	$25,813,237	0.63	0.37	50
W.Warwick	$37,506	$39,352	100.46	21	$20,203,646	$9,924,834	$10,016,007	0.49	0.50	52
Narragansett	$37,499	$44,362	113.25	9	$11,922,627	$9,052,656	$2,757,820	0.76	0.23	59
Providence	$37,385	$28,341	72.35	29	$107,648,932	$48,773,023	$56,215,964	0.45	0.52	34
Smithfield	$37,304	$49,059	125.24	3	$12,077,768	$7,808,665	$4,246,369	0.65	0.35	49
Cranston	$37,183	$41,894	106.95	14	$51,273,435	$32,393,393	$18,175,804	0.63	0.35	50
Pawtucket	$37,183	$33,680	85.98	27	$46,067,196	$19,278,939	$26,211,896	0.42	0.57	37
Lincoln	$37,124	$42,905	109.53	11	$14,900,333	$10,647,603	$4,220,506	0.71	0.28	69
E.Greenwich	$37,071	$61,845	157.88	1	$13,018,197	$9,670,524	$3,329,278	0.74	0.26	66
Newport	$36,988	$37,429	95.55	26	$22,550,838	$15,223,283	$6,141,464	0.68	0.27	53
E.Providence	$36,947	$37,633	96.07	25	$33,702,337	$20,380,876	$13,049,258	0.60	0.39	49
No. Providen	$36,941	$39,556	100.98	20	$19,707,567	$12,672,177	$6,987,835	0.64	0.35	54
Cumberland	$36,701	$45,694	116.65	8	$23,221,106	$13,897,356	$9,291,086	0.60	0.40	64
Johnston	$36,670	$38,863	99.21	22	$17,001,865	$10,120,296	$6,824,607	0.60	0.40	55
S.Kingstown	$36,525	$41,894	106.95	13	$17,367,554	$12,621,307	$4,620,258	0.73	0.27	72
Tiverton	$36,406	$41,127	104.99	18	$11,623,632	$6,636,569	$4,884,667	0.57	0.42	68
Portsmouth	$36,340	$46,662	119.12	7	$14,394,626	$9,384,349	$4,553,149	0.65	0.32	70
Barrington	$36,218	$59,498	151.89	2	$13,688,669	$10,071,508	$3,573,613	0.74	0.26	52
Scituate	$36,196	$48,996	125.08	4	$7,573,603	$4,288,443	$3,254,537	0.57	0.43	55
Middletown	$36,196	$38,400	98.03	23	$15,842,589	$8,803,106	$5,149,123	0.56	0.33	64
N.Kingstown	$35,958	$46,736	119.31	6	$23,174,786	$14,138,699	$8,848,684	0.61	0.38	66
New Shoreham	$35,950	$43,070	109.95	10	$985,595	$766,623	$211,109	0.78	0.21	29
N.Smithfield	$35,858	$47,422	121.06	5	$8,934,433	$4,822,091	$4,097,108	0.54	0.46	65
Bristol	$35,575	$39,669	101.27	19	$13,041,070	$7,061,808	$5,939,319	0.54	0.46	54
Woonsocket	$35,118	$31,659	80.82	28	$30,009,686	$9,486,070	$20,094,555	0.32	0.67	36
Burrillville	$35,008	$41,350	105.56	17	$15,389,780	$7,037,759	$8,298,417	0.46	0.54	68
Cen.Falls	$34,864	$23,413	59.77	30	$12,156,525	$3,812,997	$8,259,756	0.31	0.68	43
Warren	$34,459	$37,793	96.48	24	$8,363,891	$4,310,573	$3,996,548	0.52	0.48	53
Mean	$36,544	$41,791	$107					0.5896	0.3971	56
SD	$884	$7,530	$19					0.1218	0.1221	12

Spreadsheet 1-b

Community	PRIMARY MAT's For Grade 8 [11]	PRIMARY Graduation Rate [12]	PRIMARY Attend-Rate [13]	PRIMARY SAT College Bound [14]	Percent of RI Mean [15]	Cummulative Total of Outcomes [16]	Ranking of Cumm. Outcomes [17]	MAT's Test Grade 8 Rank [18]	Graduation Rates Rank [19]	Attendanc Rates Rank [20]	SAT's College Bound Rank [21]
Westerly	66	89.0	93.9	931	103.0	351.9	10.0	17	9	18	12
Coventry	61	85.3	94.4	920	101.8	342.5	12.0	21	15	12	13
Warwick	64	77.7	93.7	903	99.9	335.3	16.0	20	22	22	14
W.Warwick	58	75.1	92.3	850	94.1	319.5	16.0	23	24	26	23
Narragansett	77	84.3	94.8	888	98.3	354.4	3.0	4	18	7	20
Providence	40	59.1	87.5	845	93.5	280.1	25.0	30	30	30	24
Smithfield	80	96.3	94.9	889	98.4	369.6	1.0	3	2	5	19
Cranston	70	80.6	93.8	899	99.5	343.9	15.0	13	21	19	17
Pawtucket	50	70.7	93.0	824	91.2	304.9	22.0	27	27	23	27
Lincoln	76	93.6	95.3	953	105.5	370.4	6.0	6	4	1	8
E.Greenwich	81	96.1	94.8	1002	110.9	382.8	2.0	2	3	6	1
Newport	65	73.7	92.9	937	103.7	335.3	18.0	19	25	24	11
E.Providence	51	75.5	93.7	818	90.5	310.7	19.0	26	23	21	28
No. Providence	70	83.7	93.9	844	93.4	341.0	13.0	14	20	17	25
Cumberland	75	84.9	95.0	937	103.7	358.6	6.0	9	16	4	10
Johnston	65	72.2	92.7	874	96.7	326.6	20.0	18	26	25	21
S.Kingstown	76	92.6	94.7	980	108.5	371.8	5.0	8	6	10	4
Tiverton	71	84.5	94.1	901	99.7	349.3	11.0	12	17	16	16
Portsmouth	72	91.9	94.3	962	106.5	364.7	9.0	11	8	14	6
Barrington	84	92.4	94.7	986	109.1	380.2	4.0	1	7	9	3
Scituate	73	88.8	94.4	988	109.4	365.6	9.0	10	11	13	2
Middletown	67	93.2	94.6	897	99.3	354.1	8.0	15	5	11	18
N.Kingstown	76	88.0	94.8	953	105.5	364.3	2.0	7	12	8	9
New Shoreham	66	100.0	93.8	N/A	N/A	259.8	9.5	16	1	20	30
N.Smithfield	77	88.8	95.1	960	106.3	367.2	7.0	5	10	2	7
Bristol	55	87.1	91.2	837	92.6	325.9	17.0	24	13	29	26
Woonsocket	48	68.3	92.0	859	95.1	303.4	23.0	28	28	27	22
Burrillville	59	84.1	95.0	901	99.7	337.8	11.0	22	19	3	15
Cen.Falls	41	63.9	91.3	695	76.9	273.1	24.0	29	29	28	29
Warren	53	85.8	94.3	969	107.2	340.3	14.0	25	14	15	5
Mean	66	83.6	93.7	873.4							
SD	12	9.9	1.6	174.4							

Spreadsheet 1-c

Community	Sum of Rank Position[22]	Adjusted Rank Student Outcomes[23]	NEA Locals	PRIMARY Top Step NEA[24]	AFT Locals	PRIMARY Top Step AFT[25]	PRIMARY Male Teachers[26]	PRIMARY Female Teachers[27]	Total[28]	Ratio Male/ Total[29]
Westerly	56	13	Westerly	$38,035			52.1	149.5	201.6	25.8%
Coventry	61	17			Coventry	$37,600	116.9	227.2	344.1	34.0%
Warwick	78	21			Warwick	$37,511	283.0	612.9	895.9	31.6%
W.Warwick	96	25			W.Warwick	$37,506	71.0	184.9	255.9	27.7%
Narragans	49	12	Narragansett	$37,499			34.6	100.2	134.8	25.7%
Providenc	114	29			Providence	$37,385	399.2	775.3	1174.5	34.0%
Smithfiel	29	6	Smithfield	$37,304			45.0	112.2	157.2	28.6%
Cranston	70	19			Cranston	$37,183	220.8	449.8	670.6	32.9%
Pawtucket	104	27			Pawtucket	$37,183	166.0	423.0	589.0	28.2%
Lincoln	19	2			Lincoln	$37,124	61.0	122.0	183.0	33.3%
E.Greenwi	12	1	E.Greenwich	$37,071			47.0	105.5	152.5	30.8%
Newport	79	22	Newport	$36,988			99.0	190.4	289.4	34.2%
E.Provide	98	26	E.Providence	$36,947			134.0	325.0	459.0	29.2%
No. Provi	76	20			No. Providence	$36,941	55.0	174.3	229.3	24.0%
Cumberlan	39	9	Cumberland	$36,701			90.7	219.6	310.3	29.2%
Johnston	90	23			Johnston	$36,670	65.0	134.5	199.5	32.6%
S.Kingsto	28	5	S.Kingstown	$36,525			57.4	142.4	199.8	28.7%
Tiverton	61	16	Tiverton	$36,406			56.6	94.5	151.1	37.5%
Portsmout	39	10	Portsmouth	$36,340			67.9	122.5	190.4	35.7%
Barringto	20	3	Barrington	$36,218			51.0	119.6	170.6	29.9%
Scituate	36	8	Scituate	$36,196			26.1	75.9	102.0	25.6%
Middletow	49	11	Middletown	$36,196			66.0	158.3	224.3	29.4%
N.Kingsto	36	7	N.Kingstown	$35,958			88.0	227.6	315.6	27.9%
New Shore	67	18	New Shoreham	$35,950			5.9	6.6	12.5	47.2%
N.Smithfi	24	4	N.Smithfield	$35,858			30.2	87.1	117.3	25.7%
Bristol	92	24	Bristol	$35,575			55.1	118.0	173.1	31.8%
Woonsocke	105	28			Woonsocket	$35,118	151.3	265.2	416.5	36.3%
Burrillvi	59	14	Burrillville	$35,008			60.0	126.8	186.8	32.1%
Cen.Falls	115	30			Cen.Falls	$34,864	51.5	126.1	177.6	29.0%
Warren	59	15	Warren	$34,459			27.0	85.0	112.0	24.1%
			Mean	$36,381	Mean	$36,826	2734.3	6061.9	8796.2	31.1%
			SD	$830	SD	$904	(Total)	(Total)	(Total)	(Mean)

Spreadsheet 1-d

Community	Ratio Female/ Total [30]	PRIMARY Total Household Populatio [31]	PRIMARY %Fam W/child Under 18 [32]	PRIMARY House Age 65 + House- hold [33]	Ratio Age 65+/Tot Household [34]	Z Score Teacher Salary [35]	Z score State/ Total [36]	Z score Total House Population [37]	Z scores % Family Households [38]
Westerly	74.2%	21349	45.0	2262	0.11	1.69	-1.20	-0.37	-0.10
Coventry	66.0%	30582	45.7	2356	0.08	1.19	1.02	-0.06	0.05
Warwick	68.4%	84303	40.6	9281	0.11	1.09	-0.25	1.74	-1.07
W.Warwick	72.3%	29085	45.6	2717	0.09	1.09	0.78	-0.11	0.03
Narragansett	74.3%	14925	43.1	1062	0.07	1.08	-1.33	-0.58	-0.52
Providence	66.0%	148727	50.7	13972	0.09	0.95	0.99	3.89	1.15
Smithfield	71.4%	16486	44.5	1359	0.08	0.86	-0.37	-0.53	-0.21
Cranston	67.1%	72297	38.1	9064	0.13	0.72	-0.35	1.34	-1.62
Pawtucket	71.8%	72034	46.7	7856	0.11	0.72	1.37	1.33	0.27
Lincoln	66.7%	17901	41.9	2024	0.11	0.66	-0.92	-0.48	-0.78
E.Greenwich	69.2%	11747	49.2	937	0.08	0.60	-1.14	-0.69	0.82
Newport	65.8%	25881	48.1	2560	0.10	0.50	-1.01	-0.22	0.58
E.Providence	70.8%	49438	42.4	5861	0.12	0.46	-0.09	0.57	-0.68
N. Providence	76.0%	31549	36.1	3634	0.12	0.45	-0.35	-0.03	-2.06
Cumberland	70.8%	28820	41.3	2623	0.09	0.18	0.02	-0.12	-0.92
Johnston	67.4%	26117	38.8	2645	0.10	0.14	0.03	-0.21	-1.47
S.Kingstown	71.3%	19377	49.6	1778	0.09	-0.02	-1.06	-0.43	0.91
Tiverton	62.5%	14297	41.3	1308	0.09	-0.16	0.18	-0.60	-0.92
Portsmouth	64.3%	16838	50.0	1281	0.08	-0.23	-0.65	-0.52	0.99
Barrington	70.1%	15538	44.9	1371	0.09	-0.37	-1.10	-0.56	-0.13
Scituate	74.4%	N/A	46.8	N/A	N/A	-0.39	-0.58	-0.50	1.02
Middletown	70.6%	17467	50.1	1359	0.08	-0.39	0.25	-1.08	0.29
N.Kingstown	72.1%	23454	50.8	1652	0.07	-0.66	-0.13	-0.30	1.17
New Shoreham	52.8%	N/A	46.4	N/A	N/A	-0.67	-1.47	-1.08	0.20
N.Smithfield	74.3%	10207	43.1	959	0.09	-0.78	0.48	-0.74	-0.52
Bristol	68.2%	19807	42.1	1970	0.10	-1.10	0.46	-0.42	-0.74
Woonsocket	63.7%	43097	48.6	4496	0.10	-1.61	2.17	0.36	0.69
Burrillville	67.9%	15538	54.4	986	0.06	-1.74	1.13	-0.56	1.96
Cen.Falls	71.0%	17265	54.3	1645	0.10	-1.90	2.25	-0.50	1.94
Warren	75.9%	11098	44.0	1210	0.11	-2.36	0.64	-0.71	-0.32
	68.9% (Mean)	905224 (Total)	45.5 (Mean)	90228 (Total)	0.09 (Mean)	0.00 Z-Check	-0.01 Z-Check	-0.07 Z-Check	0.00 Z-Check

Spreadsheet Data Sources

1 National Education Association Rhode Island, Basic Salary Scale

2 U. S. Department of Commerce, 1990 Census of Population and Housing

3 Calculated from primary 1990 Census Data

4 Ranked based on primary 1990 Census Data

5 Rhode Island Department of Education, Statistical Tables for 1989-90

6 Rhode Island Department of Education, Statistical Tables for 1989-90

7 Rhode Island Department of Education, Statistical Tables for 1989-90

8 Calculated from primary data in R. I. Department of Education Statistical Tables for 1989-90

9 Calculated from primary data in R. I. Department of Education Statistical Tables for 1989-90

10 Rhode Island Department of Education, Statistical Tables for 1989-90

11 R. I. Department of Education, Rhode Island Public Schools Education Indicators 1990

12 R. I. Department of Education, Rhode Island Public Schools Education Indicators 1990

13 R. I. Department of Education, Rhode Island Public Schools Education Indicators 1990

14 R. I. Department of Education, Rhode Island Public Schools Education Indicators 1990

15 Calculated from primary data found in Rhode Island Public Schools Education Indicators 1990

16 Summed values of Total Educational Outcomes

17 Ranked primary data

18 Ranked primary data

19 Ranked primary data

20 Ranked primary data

21 Ranked primary data

22 Sum of ranked outcome data

23 Ranked sum of ranked outcome data

24 National Education Association Rhode Island, Basic Salary Scales

25 National Education Association Rhode Island, Basic Salary Scales

26 Rhode Island Department of Education, R. I. Public Schools Education Indicators 1990

27 Rhode Island Department of Education R. I. Public Schools Education Indicators 1990

28 Sum of primary data from R. I. Public Schools Education Indicators 1990

29 Calculated from primary data from R. I. Public Schools Education Indicators 1990

30 Calculated from primary data from R. I. Public Schools Education Indicators 1990

31 U. S. Department of Commerce, 1990 Census

32 U. S. Department of Commerce, 1990 Census

33 U. S. Department of Commerce, 1990 Census

34 Calculated fro.m U. S. Department of Commerce, 1990 Census data

35 Calculated from National Education Association Rhode Island salary data

36 Calculated from National Education Association Rhode Island salary data and Rhode Island Department of Education, Statistical Tables for 1989-90

37 Calculated from National Education Association Rhode Island salary data and U. S. Department of Commerce, 1990 Census data

38 Calculated from National Education Association Rhode Island salary data and U. S. Department of Commerce, 1990 Census data

Tables 1-a and 1-b

Table 1-a Reported Student Outcome Data,[1] typical examples

Community	Grade 8 MAT's	Graduation Rate	Attendance Rate	SAT's[2]
Barrington	84th percentile	92.4%	94.7%	986
Johnston	65th percentile	72.2%	92.7%	874

[1] *RI Dept of Education, 1990 Educational Indicators*

[2] *reported for college bound seniors*

Table 1-b Student Outcomes - *transformed* - raw data to ranked array

Community	MAT's grade 8 rank	Graduation rank	Attendance rank	SAT's rank	Sum of ranks	Final adjusted rank
Barrington	1	7	9	3	20	3
Johnston	18	26	25	21	90	23

Figure 1

Teacher Salaries v. Salary z Scores

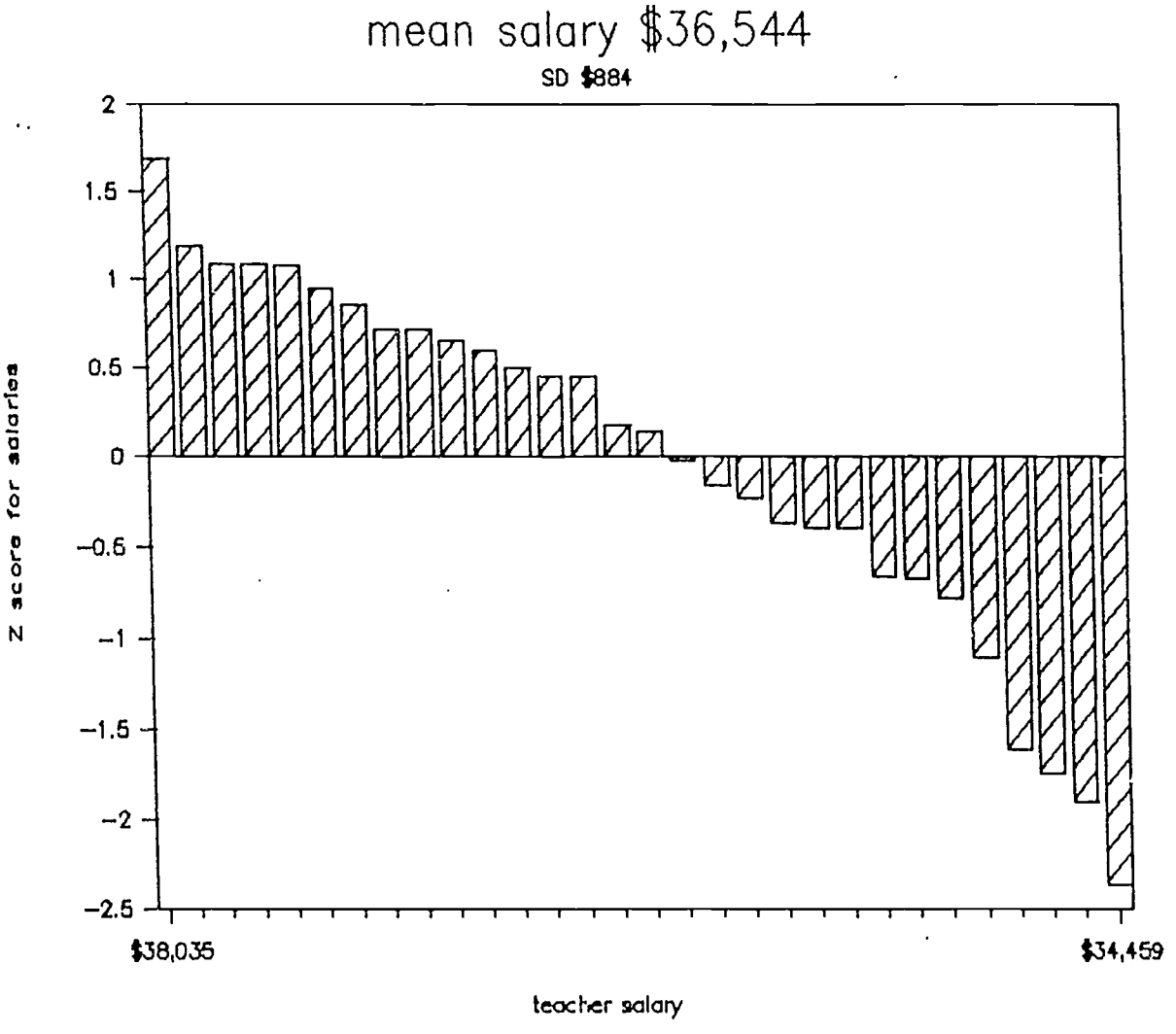

Table 2

Summary of Variables and Correlations

Table 2 Summary of Variables and Correlations

Variables	Pearson Correlation	*notes*
Salary v State / Total	-.430	
Salary v % H-holds /child under 18 yrs	-.366	*not included: Scituate and New Shoreham*
Salary v Total H-hold population	+.351	*not included: Scituate and New Shoreham*
Salary v Median family income	+.185	
Salary v Student outcomes	+.040	
Student outcomes v Median family income	+.851[1]	

[1] Spearman's Correlation used for ranked data

Figure 2

State/Total Ratio v. Teacher Salaries

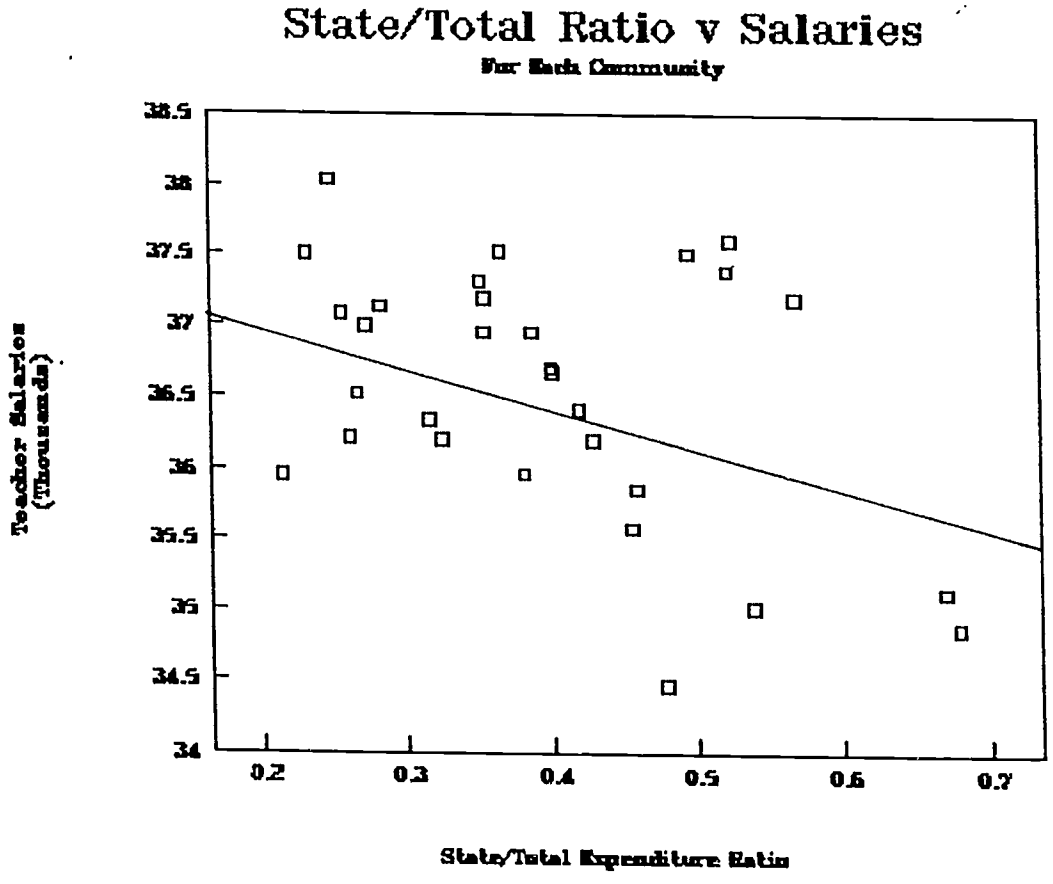

Figure 3

Percent of Households with Children Under 18 Years of Age v. Teacher Salaries

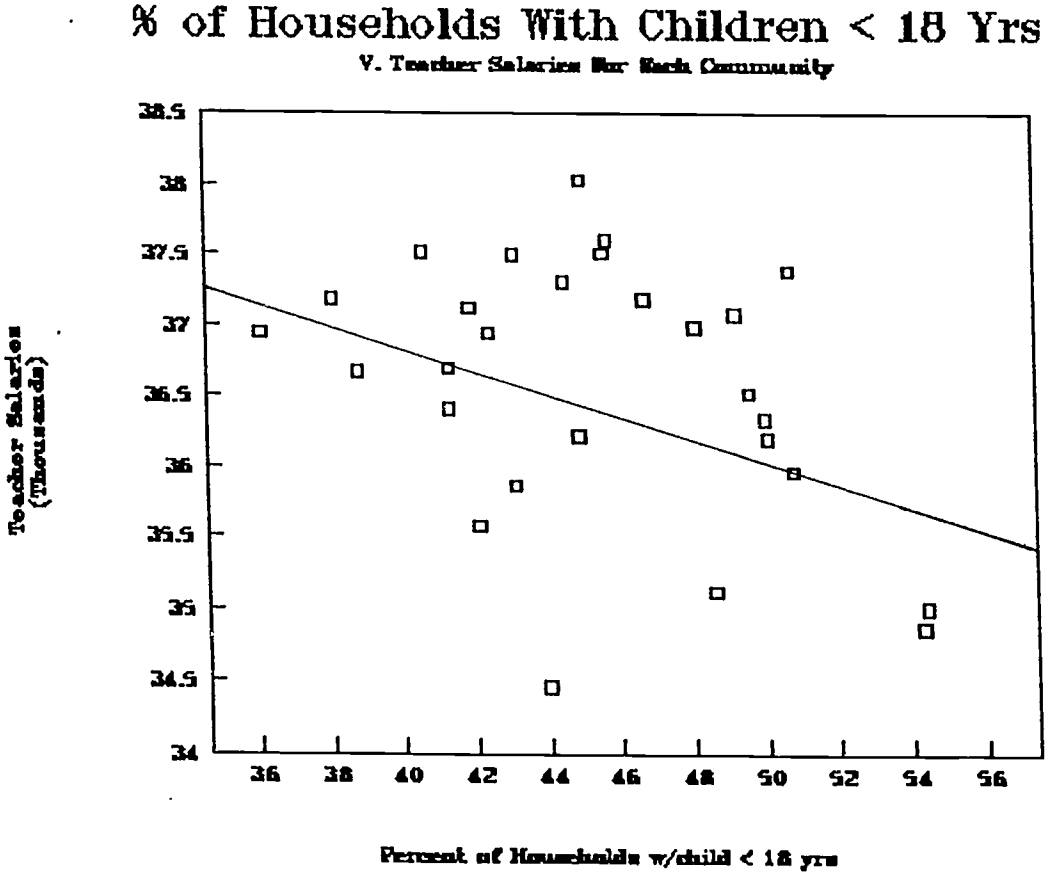

Figure 4
Total Household Population v. Teacher Salaries

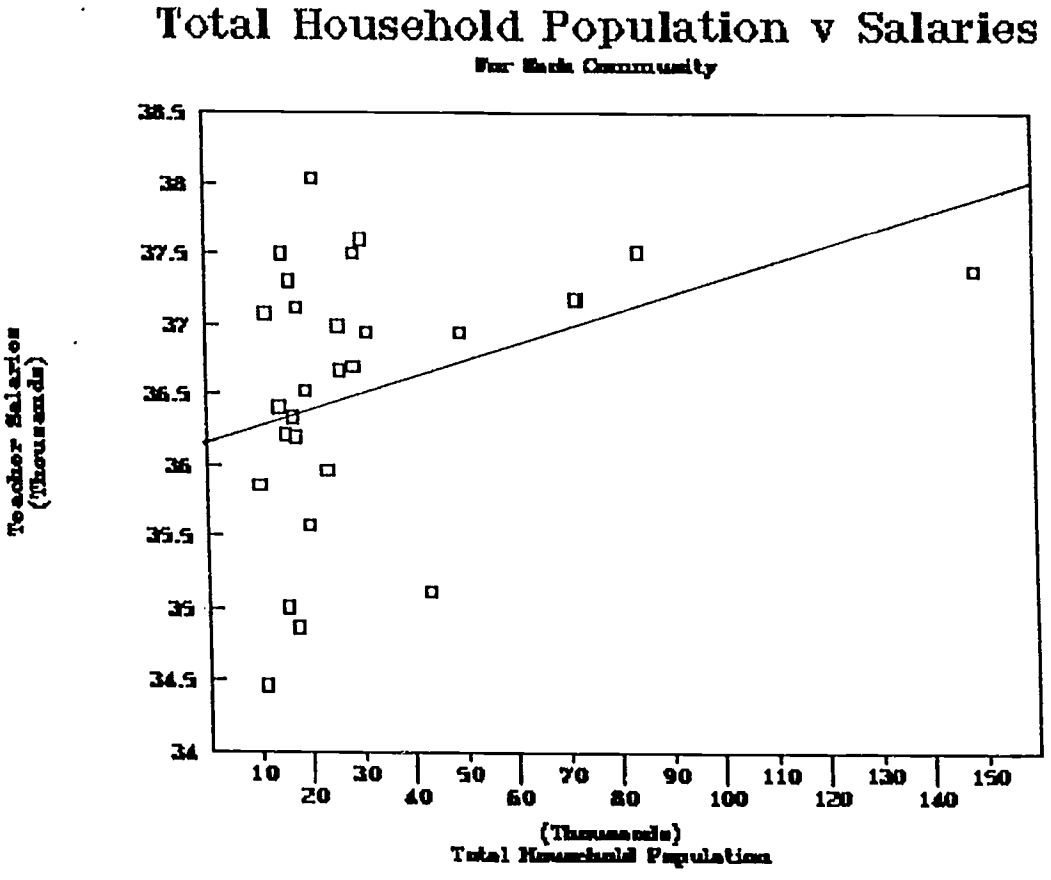

Figure 5

Median Family Income v. Ranked Student Outcomes

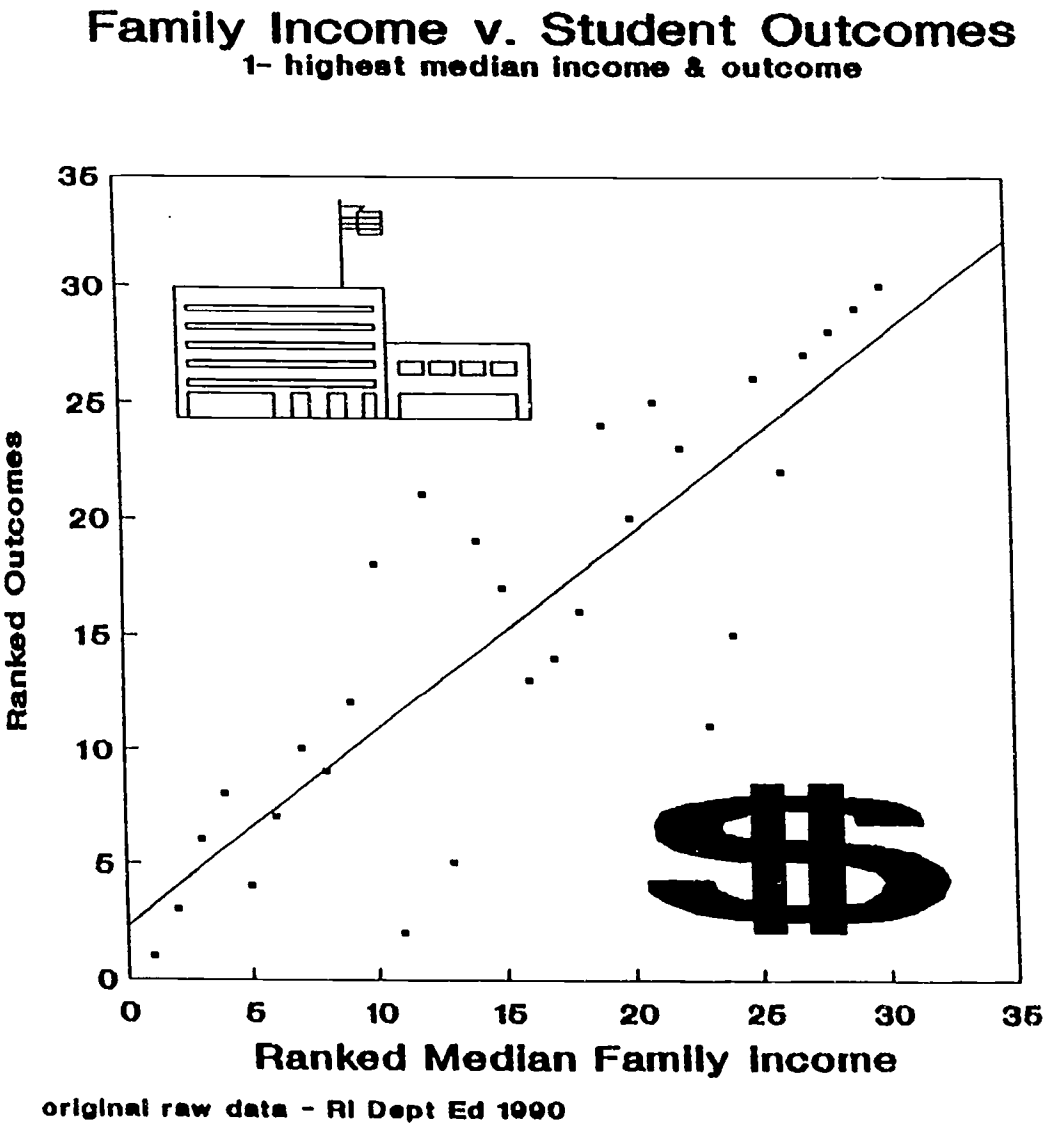

Table 3

Multiple Regression Equation
Two Variables

KWIKSTAT

Multiple Regression Results

Dependent variable is SALARY , 2 independent variables, 28 cases.

Variable	Coefficient	St. Error	t-value	p(2 tail)
Intercept	37940.402	450.50674	84.217169	0.0000
STATE/T	-4664.527	1108.9236	-4.206355	0.0003
TOTAL P	0.0159198	0.0045811	3.4751186	0.0019

R-Square = 0.4865 Adjusted R-Square = 0.4454

Analysis of Variance to Test Regression Relation

Source	Sum of Sqs	df	Mean Sq	F	p-value
Regression	11168179.3185	2	5584089.65925	11.842688	0.0002
Error	11788053.3601	25	471522.134402		
Total	22956232.6786	27			

Low p-value suggests dep. vars. SALARY may be linearly related to ind. vars.

**Prediction equation calculation:

STATE/T = .52
TOTAL P = 148727
Predicted SALARY for these values = 37882.55

+Prediction equation calculation:

STATE/T = .25
TOTAL P = 21349
Predicted SALARY for these values = 37114.14

** **Providence**

\+ **Westerly**

Table 4
Multiple Regression Equation
Three Variables

KWIKSTAT

Multiple Regression Results

Dependent variable is SALARY , 3 independent variables, 28 cases.

Variable	Coefficient	St. Error	t-value	p(2 tail)
Intercept	39392.997	1283.4456	30.693156	0.0000
STATE/T	-4221.133	1158.6759	-3.643066	0.0013
TOTAL P	0.0152306	0.0045755	3.3287198	0.0028
CHILD<18	-35.44125	29.358712	-1.207180	0.2391

R-Square = 0.5159 Adjusted R-Square = 0.4554

Analysis of Variance to Test Regression Relation

Source	Sum of Sqs	df	Mean Sq	F	p-value
Regression	11842977.9566	3	3947659.31887	8.5252994	0.0005
Error	11113254.7220	24	463052.280082		
Total	22956232.6786	27			

Low p-value suggests dep. vars. SALARY may be linearly related to ind. vars.

**Prediction equation calculation:

STATE/T = .52
TOTAL P = 148727
CHILD<18 = 50.7
Predicted SALARY for these values = 37666.33

+Prediction equation calculation:

STATE/T = .25
TOTAL P = 21349
CHILD<18 = 45
Predicted SALARY for these values = 37068.01

** **Providence**

\+ **Westerly**

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