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ABSTRACT

This analysis addresses two important questions regarding appropriate uses of the National Assessment of Educational Progress (NAEP) statewide average test score comparisons. First is whether NAEP state test score averages provide meaningful and valid comparisons of the relative educational quality or proficiency of specific states. The other question is what NAEP state test score comparisons really mean. These questions are addressed through data from the 1996 NAEP and the 1992 NAEP State Trial Assessments in Mathematics for eighth graders. Analyses indicate that 89% of the state differences in the NAEP-92 Trial State Assessment test score averages can be explained by variations in four demographic variables over which schools have no control. This suggests that rather than measuring differences in the quality or proficiency of the state's educational programs, the NAEP-92 Trial State Assessment appear to reflect differences in what might be called the difficulty of the educational tasks or challenges facing the states. Where the differences in NAEP state test score averages are found to correlate highly with certain student demographic variables, such correlations should not be used to expect less learning from children in adverse circumstances. Instead, these findings should be rough indicators of the need for appropriate resources and instructional support to help students. In addition to the demographic influences on NEAP state assessment score averages, certain nondemographic factors, such as nonresponse bias, may influence NAEP state test scores substantially, materially affecting state rankings and state comparisons. This is an additional reason for not considering state test score averages as indicators of the relative quality of proficiency of state educational programs. (Contains 10 figures and 20 references.) (SLD)

What Do NAEP State Comparisons and Rankings Really Mean?

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What Do NAEP State Comparisons and Rankings Really Mean?

This analysis will address two important questions regarding appropriate uses of the National Assessment of Educational Progress statewide average test score comparisons.

1) Do the NAEP state test score averages provide meaningful and valid comparisons of the relative educational quality, or proficiency, of specific states?
2) What do NAEP state test score comparisons really mean?

In addressing these two questions, this paper will draw from data collected in both the NAEP 1996 and the NAEP 1992 State Trial Assessments in Mathematics. Where available at the time the paper was in process, NAEP-96 data were used. Because only the general results of the *NAEP 1996 Mathematics Report Card for the Nation and the States* were available when the paper was in preparation and important NAEP-96 state student demographic data had yet to be published, it was necessary to draw from the previous statistical analysis of NAEP-92 data made by Robinson and Brandon (1994) titled: *NAEP Test Scores: Should They Be Used to Compare and Rank State Educational Quality?*. It is reasonable to assume, however, that the general relationships between student demographic characteristics and NAEP state mathematics test score averages found in the analysis of NAEP-92 data will closely match relationships to be found using NAEP-96 data.

Writing in 1991 concerning the initial NAEP-90 Trial State Assessment, Daniel Koretz, then Senior Social Scientist at the RAND corporation, stated:

> To infer that a difference between two states on the NAEP reflects specific policies or practices, one needs to be able to reject with reasonable confidence other plausible explanations, such as economic or demographic differences (1991, 20).

In the NAEP-92 Trial State Assessment reports, it is assumed that differences in state math test score averages reflected *significant* differences in the relative quality or proficiency of the states' educational programs. Before assuming that such state variations in NAEP-92 Trial State Assessment math scores do reflect *meaningful* differences in state educational policies, programs, practices, or proficiencies, it is important to examine student demographic variables to see whether or not such variables provide plausible explanations for state differences in student NAEP test score averages.

It should be noted that this analysis does not address any of the other possible uses or purposes of NAEP national or state assessments.

Data Sources and Focus of the Analysis

While both 4th and 8th graders participated in the 1992 NAEP Trial State Assessment, only data on 8th graders are used in this analysis because their self-reported answers to demographic questions are expected to be more accurate than those of 4th graders.

The 1992 NAEP includes information on several student-related factors. However, this analysis will deal with only four demographic factors—three factors as reported by NAEP-92 8th-grade test takers in each of the participating states, plus one demographic factor as reported by the U.S. Bureau of the Census for each of the states.

The reasons for concentrating on these four demographic factors are: 1) research on "at-risk" students typically emphasizes demographic factors; 2) educational policy makers and concerned citizens are more likely to attribute objectivity to demographic data; and 3) other research on the NAEP and other large-scale assessments have found links between demographic variables and student test scores. (See Cooley 1993; Drazen 1992; Lapointe et al. 1992; Lazer 1992; Wolf 1992; Pallas et al. 1989.)

The data used in the analysis for each state represent the proportion of the tested students in the state having a particular characteristic. For example, 19 percent of 8th-grade students participating in NAEP-92 in California reported living in a disadvantaged urban community (see Figure 10, page 22).

Student Demographic Variables Used in the Analysis

The student demographic variables (that is, population characteristics or factors) reported by 8th-grade NAEP test takers and used in the analysis include indicators of:

1. number of parents living at home
2. parent(s)' educational background
3. community type.

Figure 1 on page 3 lists these three demographic variables and shows the different categories or levels by which each variable is reported in the NAEP-92 data tables (NCES 1993, pp. 73, 83, 702). An asterisk indicates categories or levels of each variable that were negatively correlated with student math scores and were used in this analysis, as shown later in Figure 2 on page 4.

The fourth demographic variable used in the analysis and also shown in Figure 1 is the 1992 state *poverty rate* for children ages 5-17 in each state provided by the U. S. Bureau of the Census (1993).

Figure 1.—Demographic Variables Used in this Analysis, Showing Different Categories Reported in NAEP-92 Mathematics Assessment	
1. **Number of Parents Living at Home:** Both parents at home One parent at home* Neither parent at home*	3. **Community Type:** Advantaged urban Disadvantaged urban* Extreme rural Other community type
2. **Parent(s)' Educational Background:** Don't know Not high school graduate* High school graduate only* Some education after high school College graduate	4. **State Poverty Rate, Ages 5-17:** These are 1992 state poverty rates as reported by the U.S. Bureau of the Census.

* Categories or levels of variable used in this analysis.

SOURCE: National Center for Education Statistics 1993; U.S. Bureau of the Census 1993.

Student Demographic Variables Associated with Lower Scores on the 1992 Math NAEP

Each level or category of the demographic variables shown in Figure 1 above was correlated with the state mean scores from the 1992 NAEP mathematics test. Those demographic variable categories having a *negative* correlation with NAEP state-level math scores were used in this analysis and are shown in Figure 2 on page 4. Categories of the variables having *positive* correlations with student math scores, such as "parent(s) college graduate," are not shown in Figure 2 and were *not* used in this analysis.

Figure 2 also shows the statistical values for "R" and "R^2" for each of the variable levels listed. The "R" indicates the *direction* (either positive or negative) of the relationship in the correlation, which in these cases is negative for all of the variables listed—for example, -.84 for students living in a home with *only one parent.* The "R^2" (which is the square of the coefficient of correlation "R") is the *variance* and describes the *percentage* of variability among the states' NAEP-92 mathematics scores that can be predicted, or accounted for, using each of the variables shown.

For example, 71 percent of the variation in the 1992 state NAEP mathematics test scores can be predicted using only data on percentage of test takers in a state living in a home with *only one parent* (-.84 x -.84 = .7056 = 71%). Likewise, 56 percent of the state differences in NAEP-92 mathematics test scores can be predicted by using the single variable of *state poverty rates* for the population ages 5-17 years.

Figure 2.—Demographic Variable Categories Associated Negatively with State-Level Performance on the 1992 NAEP 8th Grade Mathematics Assessment: Correlation (R) and Percentage of Variability Explained by Each Variable (R^2)

Variable Categories or Levels	Correlation (R)	Percentage of Variability Explained by Variable (R^2)
Neither parent living at home	-.86	74%
One parent living at home	-.84	71%
State 1992 poverty rate, ages 5-17	-.75	56%
Parent(s) not high school graduate	-.68	46%
Living in a disadvantaged urban community	-.55	30%
Parent(s) high school graduate only	-.46	21%
Total Variability Explained by *All* Demographic Variables in Combination[2]		89%

[1]Includes variables with statistically significant negative correlations at the .01 level of testing. Calculated using StatView SE+Graphics software.

[2]This is a combined variable effect, not the sum of the variables listed.

Combined Effects Explain 89 Percent of State Variation

When the effects of the demographic variable categories shown in Figure 2 above are *combined* so as to account for any overlapping effects, 89 percent of the differences in NAEP-92 mathematics average scores for the 42 participating states (includes D.C.) can be predicted by the *combined* effects of state variations in the four demographic variables. The 89 percent *combined* effect shown in Figure 2 was calculated by using a multiple regression equation in which the demographic variables were used as “x’s” to predict the “y” of NAEP mathematics score averages in 1992. (See Technical Note on page 23.)

Note that this is *not* a summative procedure. If it were, the total variability would add to more than 100 percent. Rather, the equation used in calculating the *combined* effect takes into account where the variables do and do not overlap each other in predicting the test score for each state.

Figure 3 on page 6 shows the national average student NAEP-92 math score for each of the variable categories used in this analysis. Variables with negative correlations are associated with NAEP mathematics test scores that are lower than the national average student proficiency score of 266.

As described above, the categories of the four demographic factors included in Figure 2, in *combination,* explain 89 percent of the variation in state NAEP-92 math test scores. To illustrate the extent of the influence of the four demographic variables on state mean NAEP math scores in 1992, Figure 4 on page 7 plots two lines. One is the *actual* NAEP scores and the other is the *predicted* NAEP scores using the combined effects of the demographic variables shown in Figure 2.

Observe how closely the *predicted* scores match the *actual* scores. This demonstrates how closely each state's four combined demographic factors predict the state's NAEP mathematics scores for 1992.

Figure 5 on page 8 presents in tabular form the same *actual* and *predicted* state average scores shown in graphic form in Figure 4. The states are listed alphabetically for ease in comparing the *actual* and *predicted* scores and the *actual* and *predicted* rankings for each state. The data indicate that in only 12 of the 42 states did the *predicted* score vary more than 3 score points from the state's *actual* NAEP-92 mathematics average test score.

Figure 6 on page 9 shows the same data contained in Figure 5, but with the states listed according to the *rank order* of their average scores in mathematics on the NAEP-92 Trial State Assessment.

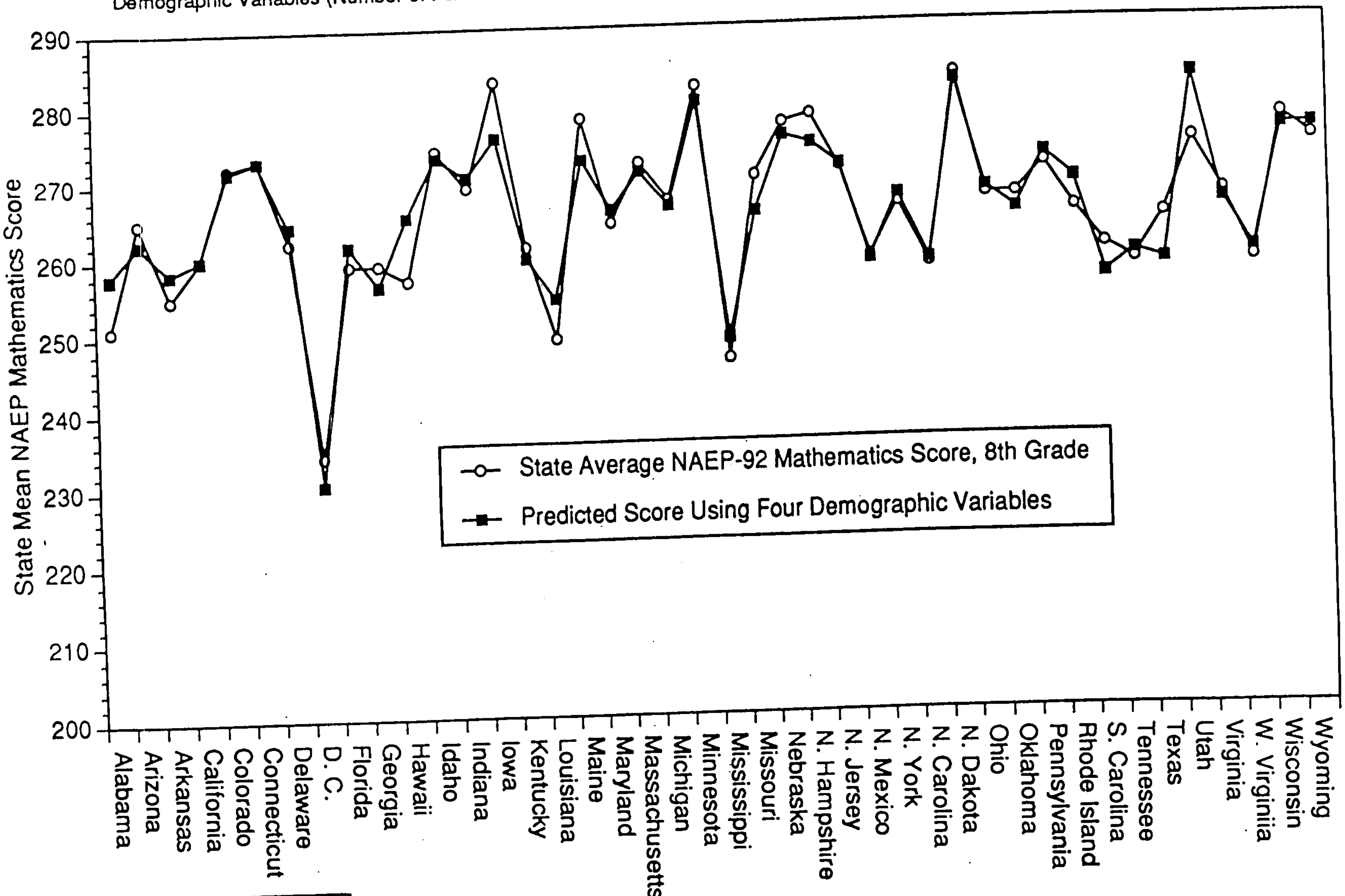
Figure 3.— State Average Student Scores on 1992 NAEP 8th Grade Mathematics Assessment, Percent of Students in Demographic Categories, and Correlation with State Average Scores for Categories of Demographic Variables

Variable Variable Category or Level	Student Average NAEP Scores	Percent of Students	Correlation with State Averages
1. Number of Parents Living at Home			
Both parents	274	76%	**.86**[1]
One parent*	260	21%	**-.84**
Neither parent*	246	3%	**-.86**
2. Parent(s)' Educational Background			
Don't know[2]	251	9%	**-.40**
Did not finish high school*	248	8%	**-.68**
High school graduate only*	257	24%	**-.46**
Some education after high school	270	18%	.38
College graduate	280	42%	**.71**
3. Community Type			
Advantaged urban	288	10%	.14
Disadvantaged urban*	238	9%	**-.55**
Extreme rural	267	9%	**.53**
Other	268	72%	.02
4. State Poverty Rate (Ages 5-17)*	---	20%	**-.75**
National 42-State Average in 1992	266	---	---

[1]**Bold** = Statistically significant correlation at the .01 level of significance.
[2]Dropped in this analysis as a non-responsive variable.
* Indicates category or level used in this analysis.

SOURCE: National Center for Education Statistics 1993, pp. 37,71, 81, 700.

Figure 4. - *Actual* NAEP 1992 State Average Mathematics Scores, 8th Grade, and *Predicted* NAEP Scores Using Combined Effects of Four Demographic Variables (Number of Parents at Home, Parent(s)' Educational Background, Community Type, and State Poverty Rate)



SOURCES: National Center for Education Statistics 1993; U. S. Bureau of the Census 1993. Calculations by ERS.

Figure 5.— Alphabetical Listing of Actual 1992 NAEP 8th Grade State Average Mathematics Scores and State Rankings, Plus State Predicted Scores Based on Combined Effects of Four Demographic Variables

Actual 1992			Predicted 1992		
State	Score	Ranking	State	Score	Ranking
Alabama	251	39	Alabama	258	34
Arizona	265	23	Arizona	262	27
Arkansas	255	38	Arkansas	258	34
California	260	29	California	260	29
Colorado	272	12	Colorado	272	11
Connecticut	273	11	Connecticut	273	9
Delaware	262	27	Delaware	264	26
Dist. of Columbia	234	42	Dist. of Columbia	230	42
Florida	259	31	Florida	261	28
Georgia	259	31	Georgia	256	38
Hawaii	257	37	Hawaii	265	23
Idaho	274	8	Idaho	273	9
Indiana	269	17	Indiana	270	16
Iowa	283	1	Iowa	276	4
Kentucky	261	28	Kentucky	260	29
Louisiana	249	40	Louisiana	254	40
Maine	278	4	Maine	272	11
Maryland	264	25	Maryland	266	20
Mass.	272	12	Mass.	271	14
Michigan	267	18	Michigan	266	20
Minnesota	282	3	Minnesota	280	3
Mississippi	246	41	Mississippi	249	41
Missouri	270	16	Missouri	265	23
Nebraska	277	6	Nebraska	275	6
New Hampshire	278	4	New Hampshire	274	8
New Jersey	271	14	New Jersey	271	14
New Mexico	259	31	New Mexico	259	31
New York	266	22	New York	267	19
North Carolina	258	34	North Carolina	258	34
North Dakota	283	1	North Dakota	282	2
Ohio	267	18	Ohio	268	18
Oklahoma	267	18	Oklahoma	265	23
Pennsylvania	271	14	Pennsylvania	272	11
Rhode Island	265	23	Rhode Island	269	17
South Carolina	260	29	South Carolina	256	38
Tennessee	258	34	Tennessee	259	31
Texas	264	25	Texas	258	34
Utah	274	8	Utah	283	1
Virginia	267	18	Virginia	266	20
West Virginia	258	34	West Virginia	259	31
Wisconsin	277	6	Wisconsin	275	6
Wyoming	274	8	Wyoming	276	4

SOURCE: National Center for Education Statistics 1993, p. 37. U. S. Bureau of Census 1993. Calculations by ERS.

Figure 6.— Rank Order Listing of Actual 1992 NAEP 8th Grade State Average Mathematics Scores and Predicted State Average Scores Based on Combined Effects of Four Demographic Variables

Actual 1992			Predicted 1992		
State	Score	Ranking	State	Score	Ranking
Iowa	283	1	Utah	283	1
North Dakota	283	1	North Dakota	282	2
Minnesota	282	3	Minnesota	280	3
New Hampshire	278	4	Wyoming	276	4
Maine	278	4	Iowa	276	4
Wisconsin	277	6	Wisconsin	275	6
Nebraska	277	6	Nebraska	275	6
Utah	274	8	New Hampshire	274	8
Wyoming	274	8	Idaho	273	9
Idaho	274	8	Connecticut	273	9
Connecticut	273	11	Maine	272	11
Massachusetts	272	12	Pennsylvania	272	11
Colorado	272	12	Colorado	272	11
New Jersey	271	14	New Jersey	271	14
Pennsylvania	271	14	Massachusetts	271	14
Missouri	270	16	Indiana	270	16
Indiana	269	17	Rhode Island	269	17
Ohio	267	18	Ohio	268	18
Michigan	267	18	New York	267	19
Oklahoma	267	18	Michigan	266	20
Virginia	267	18	Virginia	266	20
New York	266	22	Maryland	266	20
Arizona	265	23	Missouri	265	23
Rhode Island	265	23	Hawaii	265	23
Maryland	264	25	Oklahoma	265	23
Texas	264	25	Delaware	264	26
Delaware	262	27	Arizona	262	27
Kentucky	261	28	Florida	261	28
California	260	29	California	260	29
South Carolina	260	29	Kentucky	260	29
Georgia	259	31	West Virginia	259	31
New Mexico	259	31	Tennessee	259	31
Florida	259	31	New Mexico	259	31
Tennessee	258	34	North Carolina	258	34
West Virginia	258	34	Arkansas	258	34
North Carolina	258	34	Texas	258	34
Hawaii	257	37	Alabama	258	34
Arkansas	255	38	Georgia	256	38
Alabama	251	39	South Carolina	256	38
Louisiana	249	40	Louisiana	254	40
Mississippi	246	41	Mississippi	249	41
Dist. of Columbia	234	42	Dist. of Columbia	230	42

SOURCE: National Center for Education Statistics 1993. U. S. Bureau of the Census 1993. Calculations by ERS.

Observations About Rank Order Data

There are a number of interesting observations about the rank order data contained in Figure 6. The actual NAEP-92 state average scores ranged from a low of 234 to a high of 283–a mere 49-point spread (out of a test total of 500 points) among the 42 states (includes D.C.) that participated in the 1992 NAEP state trial tests. Twenty-nine of the 42 states had NAEP average scores that were the same as one or more other states, and as many as 4 states had identical scores. Moreover, 20 states had only a 10-point spread from 257 to 267 out of a maximum of 500 points. Such compact clustering of test scores makes state rankings virtually meaningless.

To illustrate the potential harm that could come from states being ranked on such compact data, especially over time, notice in Figure 6 that Ohio, Michigan, Oklahoma, and Virginia all have an average math score of 267 and therefore are tied for the rank of 18 among the 42 states. A shift of a *single* point would have dropped any one of the four states to rank 21; this shift, or even greater shifts, could have *easily* happened merely by chance or by non-school-related causes. For example, in Ohio, the standard error of the 267 mean (which is 1.5 score points) indicates that there is about a 50/50 chance that Ohio could have ranked 21 rather than 18–or about the chance of a toss of a coin.

Variations in State Participation

Because participation in the NAEP state assessments is voluntary on the part of individual states, the number of states participating in each assessment could change from one assessment to the next. This in-and-out possibility could cause substantial fluctuations in a state's rankings that were unrelated to any changes in the state's educational programs or practices. The NAEP-96 data on state participation in their rank order shown in Figure 7 on page 11 indicates that a tremendous amount of state variation in participation and reporting actually occurred between the NAEP-92 and NAEP-96 administrations of the 8th grade math assessments.

Figure 8 on page 12 shows that of the 42 states (including D.C.) with average math scores reported for NAEP-92, six did not have state average scores reported for NAEP-96. Moreover, of the 41 states (including D.C.) with average scores reported for NAEP-96, five states did not have state averages reported for NAEP-92. Thus, for only 36 states of the total 50 states and D.C. were state average scores reported for both the 1992 and 1996 administrations of the NAEP mathematics assessments, an under-reporting of 29 percent (NCES 1997, p.30).

Figure 7–Rank Order Listing of Actual 1996 NAEP 8th Grade State Average Mathematics Scores

State	Average Score	State	Average Score
North Dakota	284	Virginia	270
Maine	284	Maryland*	270
Minnesota	284	Rhode Island	269
Iowa*	284	Arizona	268
Montana*	283	North Carolina	268
Wisconsin*	283	Delaware	267
Nebraska	283	Kentucky	267
Connecticut	280	West Virginia	265
Vermont	279	Florida	264
Alaska*	278	Tennessee	263
Massachuetts	278	California	263
Michigan*	277	Georgia	262
Utah	277	Hawaii	262
Oregon	276	New Mexico	262
Washington	276	Arkansas*	262
Colorado	276	South Carolina*	261
Indiana	276	Alabama	257
Wyoming	275	Louisiana	252
Missouri	273	Mississippi	250
New York*	270	District of Columbia	233
Texas	270		

*Indicates jurdiction did not satisfy one or more of the guidelines for school participation rates in 1996

SOURCE: National Center for Education Statistics 1997.

Figure 8–Participation of States in NAEP 1992 and NAEP 1996 Assessments of Mathematics in 8th Grade

	NAEP-92	NAEP-96
Total states with scores reported	42 States & D.C.	41 States & D.C.
States in 1992 but not in 1996	Six states & average scores NH-278 ID-274 NJ-271 PA-271 OH-267 OK-267	
States in 1996 but not in 1992		Five states & average scores MT-283 VT-283 AK-278 WA-276 OR-276

Sources: National Center for Education Statistics. 1993 and 1997.

The possibilities of the enormous impact of variations in state participation on state comparative rankings are demonstrated dramatically in the case of the four states previously mentioned–Ohio, Michigan, Oklahoma, and Virginia–all with a score of 267 on the NAEP-92 math assessment and all sharing rank 18. In the NAEP-96 assessment two of the states–Ohio and Oklahoma–did not participate. Virginia's NAEP-96 average score increased to 270 resulting in the rank of 20th. But once again, Virginia shared its score and rank with three other states all with average scores of 270– Maryland, New York, and Texas.

The NAEP-96 average score reported for Michigan jumped 10 score points to 277 (a score it shared with Utah) to rank number 12. However, there was an important footnote at the bottom of the page stating that Michigan "did not satisfy one or more of the guidelines for school participation rates in 1996." It should also be noted that Maryland, New York, and seven other states shared this same cautionary footnote (NCES 1997, p.30).

Figure 8 shows that there was a 16-point spread in state average NAEP test scores among the 11 states that participated in one, but not both, of the NAEP-92 and NAEP-96 mathematics assessments. This 16-point spread–from 267 to 283–included 50 percent of the state average score reported for NAEP-92 and 59 percent of the state average scores reported for NAEP-96.

The impact of such huge variations in participation rates both among and within states from one NAEP assessment to another makes trend comparisons in state rankings based on NAEP state average test scores not only meaningless but also misleading and potentially harmful.

Major Effects of Non-Response Bias

The major problems created by non-response and the ways non-response bias can greatly affect state average scores on the NAEP, and therefore affect state rankings, was addressed early on by the Panel on the Evaluation of the NAEP Trial State Assessment Project appointed by the National Academy of Education. In its 1993 report, the NAE Panel analyzed the problem of differences in the *initial participation rates* of different states—that is, the percentage of schools from the initial sample in the state that agree to participate in the NAEP Trial State Assessment. The NAE Panel found that:

> In 1990, there were only two states with initial school participation rates below 85 percent; in the 1992 TSA, one-third of the states were in this category. The lowest 1992 participation rates were for Maine, which recruited only 62 percent of its originally sampled schools in grade 8 and 58 percent in grade 4....
>
> The potential seriousness of the low initial participation rates in some states is underscored by the Panel's finding that higher performance on the assessment was associated with lower initial participation rates. This finding was replicated in both the fourth- and eighth-grade samples, suggesting that the result was not due to chance. Furthermore, the Panel's analyses suggest that the finding was not due to one or two aberrant states. *Thus, there is a concern that states with low initial participation rates might have inflated results on NAEP, and the Panel finds some of the states' initial participation rates to be too low for accurate reporting of their 1992 TSA results* [emphasis in original] (National Academy of Education 1993, 100).

Such major non-response problems place in doubt the accuracy of current *rankings* and *comparisons* of the relative quality or proficiency of state educational programs based on NAEP-92 Trial State Assessment math score averages. In addition, the possibility of major fluctuations in initial school participation from one NAEP assessment to the next raises important concerns about the *reliability* of NAEP state test score averages as accurate and meaningful measures of *changes* in state *rankings* and *comparisons* over time.

Variations in Average Scores for Student Subgroups

Another way of viewing the impact of demographic variation on NAEP state test score averages is to examine the *national* average scores for *subgroups* of students reported for NAEP-96, shown in Figure 9 below. For example, note the 28 point difference (252 vs. 280) in the average scores for students *eligible* for free or reduced-price school lunch (used as an indicator of poverty) and students *not* eligible. Again, note the 28 point difference in the national average of scores for students whose parents did not finish high school (254 points) and the national average for students whose parents graduated from college (282), another factor related to income level.

Figure 9–Variations in NAEP-96 Nationwide Average Mathematics Scores Reported for 8th Grade Student Subgroups

Student Subgroup	**National Average**	**Standard Error**
All Students	272	1.1
Free/Reduced-Price Lunch		
Eligible	252	1.5
Not Eligible	280	1.4
Parents' Highest Education Level		
Did Not Finish High School	254	1.8
Graduated From High School	261	1.2
Some Educ. After High Sch.	279	1.4
Graduated From College	282	1.5
I Don't Know	254	1.6

Sources: National Center for Education Statistics. 1997.

Using the NAEP-96 data in Figure 9, consider two hypothetical states–A and B–both with equal quality and proficiency of their educational programs and both with students *eligible* for free or reduced-price school lunch scoring at the national average of 252 points and both with students *not eligible* scoring at the national average of 280 points. State A, however, has 50 percent of its students *eligible* for free and reduced-price lunch and 50 percent *not eligible*. State B has only 20 percent of its students *eligible* and 80 percent *not eligible*. These percentages of eligibility are within the range reported for states in the NAEP-96 assessment.

Given these conditions, the NAEP test score average for state A would be only 266 points while the test score average for state B would be 274. Obviously, the difference in the two states' average NAEP test scores does not measure differences in the performance or quality of the two states' educational systems.

Other Supporting Analyses

The major findings of this analysis are supported by similar findings of other analysts. William W. Cooley, director of Pennsylvania Educational Policy Studies at the University of Pittsburgh, in an analysis of using only three demographic variables—percent of residents not high school graduates, percent of students in poverty, and percent of single-parent homes—on NAEP-92 Trial State math scores, found that:

> Over 75 percent of the state variations in the math means can be explained by the nature of the populations being served by the schools in those states. Therefore, one clearly cannot use NAEP math score comparisons to make accurate inferences about the relative quality of the math programs in these 42 states (Cooley 1993, 29).

Richard M. Wolf, of the Department of Measurement, Evaluation, and Statistics, Teachers College, Columbia University, in analyzing the predictive effects of economic and demographic variables on the NAEP-90 Trial State math test scores, concluded:

> The evidence presented here clearly indicates that such differences cannot be rejected. If three readily available indicators, two that reflect general characteristics of a state's population and one that reflects a measure of a state's wealth, can predict average state NAEP performance so well, then what policy relevance can be obtained from state-by-state comparisons on the NAEP tests? (Wolf 1992, 12).

Relationship of Demographic Variables to District-by-District Comparisons

William W. Cooley has also examined the relationship of demographic variables to differences in test score averages among *school districts*. Cooley analyzed the average scores of the 500 Pennsylvania school districts on the state's mandated Test of Essential Learning and Literacy Skills (TELLS). He found that three demographic variables — percent of residents not high school graduates, percent of students in poverty, and percent of single-parent homes — yielded a negative multiple correlation of .78 with the school districts' TELLS scores. He concluded:

> This means that over 60 percent of the variation in the average student performance among these school districts can be explained by those three simple census factors, leaving only about 40 percent to be explained by all other possible factors, including other demographic variables besides these three.
>
> In other words, comparing districts on such a statewide test reveals more about the *difficulty of their educational task* than about the quality of their educational program [emphasis added] (Cooley 1993, 28).

Such findings regarding the strong effects of demographic variables on the variation in student achievement test score averages among *school districts* within a state are important because some policy makers are urging the expanded use of NAEP data to compare and rank *local school districts* on their average NAEP test scores.

State NAEP Score Adjustment Controversy

To provide "fairness" in state NAEP rankings, it has been proposed that the state NAEP test scores be adjusted statistically "to reflect differences among the states in school resources and in the ethnic, economic, and other characteristics of their student populations" (Viadero 1994, 1).

One method of adjustment would call for analyzing how a state might fare on the assessment if its population mirrored that of the nation as a whole. Another method would be to look at a state's scores as if the nation's population had the same demographic characteristics as the state. Other factors that might be used to adjust state NAEP scores include those reflecting student "opportunity to learn" factors, such as state differences in per pupil expenditures and other measures of school resources.

Emerson J. Elliott, former Commissioner of Education Statistics, U.S. Department of Education, stated:

> This is an important issue, and it can't be washed away by saying the only thing the statistical agency should do is report results for the overall population (Viadero 1994, 18).

However, critics of the idea of statistical adjustments to NAEP state scores charge that such changes to state scores "would implicitly concede that poor children cannot be expected to do as well in school as their more affluent peers" (Viadero 1994, 1).

Edward Roeber, director of State Collaborative Programs on Assessment for the Council of Chief State School Officers, makes this observation about the idea of adjusting state NAEP test scores:

> Rather than saying we have standards we want all students to meet, these kinds of efforts literally have given us the idea that poor children cannot learn. The implied message is, "you have lots of poor children, so your scores should be lower" (Viadero 1994, 18).

Chester E. Finn, Jr., a former member of the National Assessment Advisory Board, declared that proposals to statistically adjust state NAEP test scores are:

> ... probably the worst idea I've encountered in 10 years of closely watching NAEP. Once you start fiddling with the numbers you can ... show anything you like, and then you begin to lose public confidence (Viadero 1994, 18).

However, Grissmer, Kirby, Berends, and Williams concluded in a RAND study of *Student Achievement and the Changing American Family:*

Comparisons of simple, unadjusted test scores from one year to the next or across different schools or districts do not provide a valid indicator of the performance of the teachers, school, or school districts unless the differences in scores are very large compared to what might be accounted for by changing demographic or family characteristics. This is rarely the case; so, any use of unadjusted test scores to judge or reward teachers or schools will inevitably misjudge which teachers and schools are performing better. (Grissmer, et al., 1994).

An example of the complicated and controversial problems that can occur when NAEP Trial State Assessment data are statistically adjusted to account for state demographic variables occurred in New Jersey. When the state teachers union, the New Jersey Education Association (NJEA), learned that the state ranked 14th in mathematics test scores among the 42 states that participated in the NAEP-92 math assessment (see Figure 6, page 9), NJEA officials commissioned a study in hopes that "the results would show that the state's public school teachers are doing a good job" (*Education Week* 1994, 4).

NJEA commissioned Howard Wainer, a researcher for the Educational Testing Service, to do an analysis *independent* of the ETS federal NAEP assessment program. The analysis found that when factors such as race and the number of limited-English-proficient students were factored in, New Jersey moved from rank 14 to rank 4 among 42 participating states (*Education Week* 1994, 4).

It is *technically feasible* to make mathematical adjustments in the NAEP Trial State Assessment scores that *statistically* take into account the effects of various factors related to the states' NAEP score rankings. There is much evidence, however, that such adjustments to state NAEP test scores would be highly controversial and would probably create even more problems than the adjustments would solve.

Measuring Difficulty of the Educational Challenges

The fact that 89 percent of the state differences in NAEP-92 Trial State Assessment mathematics test score averages can be explained by variations in four demographic variables over which schools have no control raises a serious question: What *are* the differences in the NAEP-92 Trial State math scores actually measuring? Rather than measuring differences in the quality or proficiency of the states' educational programs, the NAEP-92 Trial State average math scores appear to more accurately reflect differences in what, as previously cited, William Cooley has termed the *difficulty of the educational tasks* confronting the various states (Cooley 1993, 28).

Since the word *tasks* may imply unwanted burdens, the term *difficulty of the educational challenges* is perhaps more descriptive of what the differences in NAEP state test score averages appear to reflect. But whatever the term, it is abundantly clear that modest differences in NAEP state mathematics test score averages do not reflect real or meaningful comparative differences in the relative educational quality, or proficiency, of specific states. Moreover, the indications are that the gross comparative ranking of the states on the basis of NAEP state average test scores can lead to misconceptions about the relative educational quality of specific states. But it is equally clear that statistical adjustments of NAEP test scores can lead to even further misconceptions.

Scores Not Reliable Measures of Educational Effectiveness

There is evidence that these same findings regarding NAEP state test score comparative rankings also apply to comparisons of average test scores among districts within a state, among schools within a district, and even among teachers within a school. There is much research that shows some schools and teachers who are faced with very difficult educational challenges and with low but rising student test scores are working to overcome enormous educational disadvantages and huge social neglect. These schools and teachers are producing quantities and qualities of student learning not currently recognized or appreciated by popular perspectives of test score comparisons. Some researchers have found that such effective schools and teachers are actually more educationally productive than are other schools and teachers where student test scores are high but where school and teacher efforts are augmented by strong family advantages and nurturing communities, and consequently, where the educational challenges are much less demanding.

Evidence of such effects was found by David Grissmer et. al,. in the previously cited RAND study of *Student Achievement and the Changing American Family*:

> Indeed, the evidence provided here hints that a stronger case could be made that teachers and schools with large numbers of minority students may have been responsible for the most significant gains in test scores over the last 20 years, while family effects–not schools–may have been responsible for gains in nonminority scores. . .this evidence illustrates the possibility of dramatic changes in perspective that more detailed analyses can provide (Grissmer 1994, 19-20).

Change in Perspective

The statistical evidence is unmistakable; NAEP state test score gross averages are not measures of the relative differences in the proficiency of the states educational systems. The compelling evidence is that certain demographic and economic factors are much more accurate in predicting differences in NAEP state test score averages than are all other factors combined, including any possible differences in the educational quality or proficiencies of the various states.

This unequivocal evidence calls for a dramatic change in the current perspective about the meaning and use of NAEP state test score averages. The popular concept that NAEP gross test score averages are reliable measures of comparative educational performance and proficiency about which citizens and agencies can feel either pride or concern about the relative quality of their state's educational system is unwarranted and without support. Rather than being viewed as meaningful measures for educational accountability, NAEP gross state test score averages should be viewed as only rough reverse indicators of the relative quantities and nature of resources needed for the varied populations of students in the separate states to achieve equal levels of learning.

The evidence calls for perceiving NAEP state test score averages as merely rough reflections of the differences in the *difficulty of the educational challenges* confronting the states. But the question immediately arises: Does this concept mean that students in adverse environments should be expected to meet lower academic standards than expected for other students? Absolutely not!

The concept of the *difficulty of the educational challenge* merely recognizes the fact that students in adverse learning environments require more resources, more time, more proficient pedagogical skills, and more adept instructional approaches in order to overcome their disadvantages. Clearly, considerably more resources and teaching efforts are required if students in disadvantaged environments are to be provided an equal opportunity to learn and achieve at the same levels as advantaged students.

It is unfair and even unethical to expect many students, for whom research clearly shows start with major family, community, economic, and other educational disadvantages, to achieve at the same rates and levels as advantaged students *without* providing the disadvantaged students with sufficient and effective additional learning resources and instructional support. This fundamental principle applies throughout education. It most certainly underlies inferences relating to comparisons and rankings based on NAEP test score averages for states or school districts.

State Data Used in This Analysis

The state-by-state NAEP-92 data for each of the demographic variables used in calculating the predicted state scores and state rankings used in this analysis are shown in Figure 10 on page 22.

Summary and Conclusions

This analysis has addressed the important question of whether NAEP state test score averages should be used for the purpose of *comparing* and *ranking* the quality of mathematics instruction among the various states. The analysis has also addressed the question: What do NAEP state test score comparisons really mean? In addressing these questions, the paper draws from data collected in both the NAEP 1996 and the NAEP 1992 State Trial Assessments in Mathematics for 8th grade students. Other uses and purposes of NAEP state or national assessments were not addressed in the analysis.

To accept a specific factor as a *valid* measure of the relative quality or proficiency of mathematics instruction among the states, one must be able to reject with reasonable confidence other possible factors influencing average test score differences, such as economic or demographic variables.

This analysis found that 89 percent of the variation in state average test scores on the NAEP-92 Trial State Assessment in mathematics can be explained by the combined effects of four demographic variables — number of parents living at home, parent(s)' education, community type, and state poverty rates. This leaves only 11 percent of the differences among the state test score averages to be explained by all other variables including differences in the educational quality or proficiency of the various states.

Since test score averages among the states are so strongly affected by four demographic factors over which schools have no control, NAEP-92 state test score averages in 8th grade mathematics scores are shown *not* to be valid measures to use for the purpose of *comparing* and *ranking* states according to the relative quality or proficiency of the states' educational programs. Neither are similar test score averages valid measures to use for *comparing* and *ranking* school districts within a state according to the relative quality or proficiency of the districts' educational programs.

In view of the finding that 89 percent of the state test score differences can be explained by four specific demographic variables, it is important to ask: What *are* the differences in the NAEP-92 Trial State math scores actually measuring? Rather than measuring differences in the quality or proficiency of the states' educational programs, the NAEP state average scores were found to more accurately reflect differences in the *difficulty of the educational challenges* confronting the various states.

While the differences in NAEP state test score averages are found to correlate highly with certain student demographic variables, such correlations should not be used as an excuse to expect less learning from children in adverse circumstances. Rather, these findings should be viewed as rough indicators of the need for appropriate resources and instructional support to help diverse combinations of student populations in the different states achieve equally high educational standards and learning levels. Analysts examining other assessment data for local school districts within states have also found a strong relationship between demographic variables and the districts' averages of student scores on state tests.

This analysis found that, in addition to the demographic influences on NAEP state assessment score averages, certain *non-demographic* factors, such as non-response bias—including major variations in state participation from one NAEP assessment to the next plus major variations in initial school participation rates within states–may substantially influence NAEP state test score averages and thus materially affect state *rankings* and state *comparisons*. The possible strong influence of such *non-demographic* variables adds an important reason for *not* considering or using NAEP state test scores averages as indicators of the relative quality or proficiency of state educational programs.

Proposals have been made to adjust state NAEP scores statistically to reflect more fairly the effects of state variations in factors such as school resources, ethnic groups, and specific demographic characteristics of the student population. However, debate on this idea indicates clearly that such statistical adjustments would be complicated, highly controversial, and create more problems than they would solve.

The findings of this analysis regarding the major impact of demographic factors on NAEP state assessment score averages indicate the need for a new perception of NAEP test scores that will focus attention, resources, and efforts toward addressing the *difficulty of the educational challenges* confronting states, districts, and schools rather than using NAEP assessment data to inappropriately and unfairly *compare* and *rank* states on presumed differences in the *quality* of their educational programs.

* * *

Figure 10—State Demographic Category/Level Data Used in Analysis of 1992 NAEP State 8th Grade Mathematics Assessment Participants

	Parent(s)' Education		Parent(s) Living at Home		Community	Poverty
State	Not High School Graduate	High School Graduate Only	One Parent Living at Home	Neither Parent Living at Home	Student Living in Disadvantaged Urban Community.	State Poverty Rate, 1992 (Ages 5-17)
Average for 42 States and DC	8%	25%	21%	3%	9%	19.6%
Alabama	13%	29%	24%	3%	16%	23.5%
Arizona	10%	21%	22%	3%	14%	21.9%
Arkansas	11%	31%	21%	4%	5%	20.8%
Califomia	10%	17%	22%	4%	19%	22.1%
Colorado	6%	21%	21%	2%	10%	10.9%
Connecticut	6%	22%	19%	2%	17%	16.5%
Delaware	6%	30%	24%	3%	0%	11.2%
Dist. of Colum.	9%	29%	47%	8%	67%	31.8%
Florida	8%	24%	25%	3%	17%	21.6%
Georgia	11%	30%	25%	3%	10%	27.8%
Hawaii	6%	25%	21%	4%	16%	15.9%
Idaho	7%	19%	15%	2%	5%	20.2%
Indiana	8%	32%	20%	2%	11%	13.2%
Iowa	4%	25%	16%	2%	3%	14.7%
Kentucky	15%	32%	20%	3%	12%	23.1%
Louisiana	10%	30%	25%	4%	19%	32.4%
Maine	6%	26%	17%	2%	2%	16.5%
Maryland	6%	25%	23%	3%	13%	16.0%
Massachusetts	7%	21%	21%	2%	23%	18.2%
Michigan	6%	26%	23%	3%	19%	17.9%
Minnesota	3%	22%	14%	1%	0%	17.0%
Mississippi	13%	29%	27%	4%	6%	30.6%
Missouri	8%	29%	21%	3%	12%	18.6%
Nebraska	4%	24%	17%	2%	6%	14.2%
New Hamp	6%	24%	17%	2%	0%	9.3%
New Jersey	7%	23%	19%	3%	24%	13.0%
New Mexico	11%	26%	22%	3%	6%	27.7%
New York	6%	23%	23%	2%	16%	23.4%
North Carolina	10%	27%	24%	3%	5%	23.7%
North Dakota	3%	19%	13%	1%	0%	12.9%
Ohio	7%	32%	23%	2%	17%	18.3%
Oklahoma	8%	26%	20%	3%	5%	19.4%
Pennsylvania	7%	30%	19%	2%	15%	14.6%
Rhode Island	8%	22%	20%	2%	12%	19.6%
South Carolina	9%	31%	23%	4%	6%	27.7%
Tennessee	12%	29%	24%	3%	7%	17.1%
Texas	16%	21%	22%	3%	18%	23.2%
Utah	3%	15%	14%	1%	5%	11.2%
Virginia	9%	24%	21%	3%	13%	14.3%
West Virginia	13%	33%	19%	3%	10%	31.7%
Wisconsin	5%	28%	19%	1%	5%	13.8%
Wyoming	5%	23%	17%	2%	10%	12.3%

SOURCE: National Center for Education Statistics 1993. U. S. Bureau of the Census 1993. Calculations by ERS.

Technical Note

Data on the percentage of students in each state falling within four categories—living in a disadvantaged urban community, the state poverty rate for children ages 5-17, parent(s) who did not graduate from high school or did not continue their education beyond high school, and only one parent or neither parent at home—were placed into a multiple regression equation with 1992 state NAEP mathematics scores as the dependent "y" variable to be predicted.

The resulting equation was used to generate the predicted scores based on the state demographic variables. The equation generated is:

y = 303.223+(-.758 x Parents Not High School Graduates)

+(-.01 x Parents High School Graduates Only)+(-.928 x One Parent at Home)

+(-2.926 x Neither Parent at Home)+(.152 x Disadvantaged. Urban Community)

+(-.28 x State Poverty. Rate, Ages 5-17).

References

Cooley, W. W. 1993. "The Difficulty of the Educational Task: Implications for Comparing Student Achievement in States, School Districts, and Schools." *ERS Spectrum* Vol. 11, No. 3 (Summer 1993): 27-31.

Drazen, S. 1992. *Student Achievement and Family and Community Poverty: Twenty Years of Education Reform.* Paper presented at the Annual Meeting of the Eastern Psychological Association, Boston, Massachusetts, April 2-5, 1992. (ED 346 234).

Education Week. April 27, 1994. "N.J. Study Shows Race, Language Have Impact on NAEP Scores." P. 4.

Grissmer, D. W., S. N Kirby, M Berends, S Williamson. 1994. *Student Achievement and the Changing American Family: An Execut ive Summary.* Santa Monica, CA. RAND.

Haertel, E. H. April 1991. "Should the National Assessment of Educational Progress Be Used to Compare the States?" *Educational Researcher* Vol. 20, No. 3: 17.

Koretz, D. M. April 1991. "State Comparisons Using NAEP: Large Costs, Disappointing Benefits." *Educational Researcher* Vol. 20, No. 3: 19-21.

Lapointe, A. E., N. A. Mead, and J. M Askew. 1992. *Learning Mathematics.* Princeton, NJ: Educational Testing Service.

Lazer, S. 1992. *Learning About the World.* Princeton, NJ: Educational Testing Service.

Mullis, I. V. S., J. A. Dossey, E. H. Owen, and Gary W. Phillips. 1993. *NAEP 1992 Mathematics Report Card for the Nation and the States: Data from the National and Trial State Assessments.* Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

National Academy of Education. 1993. *The Trial State Assessment: Prospects and Realities. The Third Report of The National Academy of Education Panel on the Evaluation of the NAEP Trial State Assessment: 1992 Trial State Assessment.* Stanford, CA: Author.

National Center for Education Statistics. 1997. *NAEP 1996 Mathematics Report Card for the Nation and the States.* Washington, DC: U.S. Government Printing Office.

National Center for Education Statistics. 1993. *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States.* Washington, DC: U.S. Government Printing Office.

National Center for Education Statistics. 1990. *National Education Longitudinal Study of 1988: A Profile of the American Eighth Grader.* Washington, DC: U.S. Government Printing Office.

Pallas, A. M., G. Natriello, and E. L. McDill. 1989. "The Changing Nature of the Disadvantaged Population: Current Dimensions and Future Trends," *Educational Researcher* Vol. 18, No. 5: 16-22.

Phillips, G. W. April 1991. "Benefits of State-by-State Comparisons." *Educational Researcher* Vol. 20, No. 3: 17-19.

Robinson, G., and D Brandon. 1992. *Perceptions About American Education: Are They Based on Facts?* Arlington, VA: Educational Research Service.

Robinson, G., and D Brandon. 1994. *NAEP Test Scores: Should They be Used to Compare and Rank State Educational Quality?* Arlington, VA: Educational Research Service.

U.S. Bureau of the Census. 1993. *Table 25. Poverty Status by State and Ten Large Metropolitan Areas in 1992.* Washington, DC: Author.

Viadero, D. 1994. "Proposal to Adjust NAEP Scores for Diversity Muddled." *Education Week* (March 9, 1994): 1, 18.

Wolf, R. M. 1992. "What Can We Learn from State NAEP?" *Educational Measurement: Issues and Practice* Vol. 11, No. 4: 12.

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