

THE RISKS OF RANKING

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Conventional wisdom tells us that a simple rank ordering by test scores of nations, states, school districts, or schools can provide valid information about the relative strengths of their education programs. The fact is, however, that these rankings have more to do with student selectivity and poverty levels than they do with the quality of education and, therefore, provide misleading information about educational effectiveness.

In my remarks today, I will discuss a set of tables that show the fallacy of assuming that rankings can provide valid information about the quality of schools--or even the quality of an athletic program. To illustrate the point, I begin with the 1996 summer Olympic games. As shown in Table 1, the top five medal winners in the Olympic games were the United States, Germany, Russia, China, and Australia. It may seem reasonable to conclude, therefore, that these countries have the most athletic populations, the best training programs, or the most dedicated citizens.

Table 1

A simple ranking by total medals, however, places small countries at a disadvantage. When we re-rank countries based on medals earned as a proportion of population (Table 2), the following five countries are on top: New Zealand, Jamaica, Cuba, Australia, and Ireland. Australia has remained in the top five, but Germany drops to 19th place, Russia to 27th place, the United States to 30th place, and China drops off this table.

Table 2

Based on these data, we may conclude that New Zealand, Jamaica, Cuba, Australia, and Ireland are the countries with the most athletic populations, the best training programs, or the most dedicated citizens. But these conclusions turn out to be just as fallacious as those in the previous example because the rankings, based on very small numbers of medals, may simply reflect idiosyncrasies--for example, the fact that in Ireland one swimmer received four medals and that she alone accounted for all of Ireland's medals and its fifth-place ranking.

The point is that the rankings, even when adjusted for variables such as population, give us no information about the reasons that one country ranks high and another low and therefore are of little use in developing future athletic programs. If rankings based on Olympic medals are irrelevant to program improvement, what can be said about the much more complicated task of interpreting the rank order of nations, states, or schools based

on student test scores--and then attempting to formulate education policy based on these findings?

Consider, for example, rankings of states based on SAT mathematics averages in 1996, as shown in Table 3. Iowa, North Dakota, Utah, South Dakota, and Mississippi ranked among the top states. New Hampshire, New Jersey, Connecticut, Vermont, New York, and Pennsylvania ranked in the bottom half. These rankings may lead us to conclude that the high-scoring states, when compared with states near the bottom of the distribution, have superior academic standards, a more challenging mathematics curriculum, or a teacher accountability system that ensures excellence.

Table 3

There may, however, be a simpler explanation. In the high-ranked states, as few as four or five percent of the high school graduates took the SAT. In the low-scoring states, the percentage of graduates taking the SAT reached 70 and 80 percent. The states with the highest SAT mathematics averages tend to have the lowest proportions of students taking the test. The point is that the more highly selected the students who take the test, the higher will be the average score. That score has little to do with the quality of education.

I commented in a recent article (I thought in jest) that one way to increase a state's average SAT score would be to discourage students from applying to colleges that require the test. I received in response a letter asking whether I believed such things did not happen. The writer resided in a high-income district that had recently merged with a low-income district. Students in the low-income area were actively discouraged from taking the SAT because of the concern that they would depress the average score--which in turn might depress property values.

I turn now to another table to determine whether the ranking of states based on SAT scores is consistent with the ranking based on mathematics proficiency on an international test. Unlike SAT scores, which reflect the average of a self-selected group of students, the rankings in Table 4 are based on a test given to a more representative sample of students. The wide discrepancies between the state rankings based on SAT scores and those based on the international test are obvious. Mississippi and Pennsylvania, for example, have reversed places: Mississippi, which ranked fourteenth in the SAT table now ranks next to last in the international test score comparisons, while Pennsylvania moves from forty-sixth in the SAT ranking to the top third in the international test ranking. Yet, we often hear states praised, or censured, for their performance on one or the other test.

Table 4

Is there any evidence that the ranking on the international test reflects the relative quality of education in the states? Like the ranking based on SAT scores, the table does not provide information about educational quality--or how to strengthen it. It does, however,

show that a strong relationship exists between poverty rates and test scores: High levels of poverty are associated with low test scores. New Hampshire, with the lowest proportion of children in poverty, ranks fifth in the test score comparisons. Louisiana, with the highest proportion of children from low-income families, ranks fortieth out of forty-two states in the comparisons.

States with low proportions of students taking the test, and low poverty rates, tend to rank high on both tables. Conversely, states with high proportions of students taking the test, and high poverty rates, rank low on both tables. The point is that we can assign neither credit nor blame to schools based on the information provided by these tables.

Table 5 shows the ranking of both states and countries on the international test. The test scores of Iowa, North Dakota, and Minnesota are similar to the top-scoring countries--Taiwan and Korea. At the other extreme, Alabama, Louisiana, and Mississippi score about the same as Jordan, the lowest-scoring country in that international comparison. The powerful influence of poverty is all too evident.

Table 5

The state rankings illustrate two points. First, they show the powerful influence of student selectivity and poverty. Second, they show the idiosyncrasies of ranking by test scores: A state that ranks high on one test score comparison may rank low on another for reasons that have nothing to do with the quality of education.

Clearly, student performance is related to the quality of education. Carefully controlled studies show that the characteristics of education programs--for example, teacher qualifications and class size--can make a difference. Nonetheless, a simple rank ordering of states by test scores is too crude a measure to give any information about educational quality because student selectivity and socioeconomic status overwhelm the educational environment as a determinant of test score rankings.

In short, test score rankings tell us about student selectivity. They tell us about poverty. They tell us little about the quality of schools or about the expertise and motivation of teachers. Perhaps most important, they give us no guidance about how to strengthen our schools.

TABLE 1

MEDALS LIST

Final	G	S	B	Total
USA	44	32	25	101
Germany	20	18	27	65
Russia	26	21	14	61
China	16	22	12	50
Australia	9	9	23	41
France	15	7	15	37
Italy	13	10	12	35
South Korea	7	15	5	27
Cuba	9	8	8	25
Ukraine	9	2	12	23
Canada	3	11	8	22
Hungary	7	4	10	21
Romania	4	7	9	20
Netherlands	4	5	10	19
Poland	7	5	5	17
Spain	5	6	6	17
Britain	1	8	7	16
Bulgaria	3	7	5	15
Brazil	3	3	9	15
Belarus	1	6	8	15
Japan	3	6	5	14
Czech Republic	4	3	4	11
Kazakhstan	3	4	4	11
Greece	4	4	0	8
Sweden	2	4	2	8
Kenya	1	4	3	8
Switzerland	4	3	0	7
Norway	2	2	3	7
Denmark	4	1	1	6
Turkey	4	1	1	6
New Zealand	3	2	1	6
Belgium	2	2	2	6
Nigeria	2	1	3	6
North Korea	2	1	3	6
Jamaica	1	3	2	6
South Africa	3	1	1	5
Ireland	3	0	1	4
Finland	1	2	1	4
Indonesia	1	1	2	4
Algeria	2	0	1	3
Ethiopia	2	0	1	3
Iran	1	1	1	3
Slovakia	1	1	1	3
Yugoslavia	1	1	1	3
Argentina	0	2	1	3
Austria	0	1	2	3
Armenia	1	1	0	2
Croatia	1	1	0	2
Portugal	1	0	1	2
Thailand	1	0	1	2
Namibia	0	2	0	2
Slovenia	0	2	0	2
Malaysia	0	1	1	2
Moldova	0	1	1	2
Uzbekistan	0	1	1	2
Georgia	0	0	2	2
Morocco	0	0	2	2
Trinidad & Tobago	0	0	2	2
Burundi	1	0	0	1
Costa Rica	1	0	0	1
Ecuador	1	0	0	1
Hong Kong	1	0	0	1
Syria	1	0	0	1
Azerbaijan	0	1	0	1
Bahamas	0	1	0	1
Latvia	0	1	0	1
Philippines	0	1	0	1
Taiwan	0	1	0	1
Tonga	0	1	0	1
Zambia	0	1	0	1
India	0	1	0	1
Israel	0	0	1	1
Mexico	0	0	1	1
Mongolia	0	0	1	1
Mozambique	0	0	1	1
Puerto Rico	0	0	1	1
Tunisia	0	0	1	1
Uganda	0	0	1	1

TABLE 2

TURNING THE TABLES

When population is the guide, the Atlanta Games medals table looks very different. Places are worked out by awarding four points for a gold, two for silver and one for bronze, and then dividing a country's population by its points total:

	Country	Pop in million	Gold 4 pts	Silver 2 pts	Bronze 1 pt	Total points	Population per point
1	(25) New Zealand	3.5	3	2	1	17	205,900
2	(38) Jamaica	2.5	1	3	2	12	208,300
3	(9) Cuba	11.0	7	7	8	50	215,700
4	(7) Australia	18.0	9	9	20	74	243,200
5	(26) Ireland	3.5	3	0	1	13	269,200
6	(13) Hungary	10.0	5	4	9	37	270,300
7	(17) Denmark	5.2	4	1	1	19	273,700
8	(20) Bulgaria	9.0	3	6	5	29	310,300
9	(29) Norway	4.3	2	1	3	13	330,800
10	(16) Switzerland	7.0	4	2	0	20	350,000
11	(45) Slovakia	2.0	1	0	1	5	400,000
12	(15) Greece	10.0	4	4	0	24	416,700
13	(36) Belorussia	10.2	4	6	8	24	425,000
14	(23) Czech Rep	10.3	3	3	4	22	468,200
15	(22) Netherlands	15.2	3	5	10	32	475,000
16	(40) Finland	5.0	1	2	1	9	555,600
17	(14) Romania	22.0	4	7	8	38	578,900
18	(44) Armenia	3.6	1	1	0	6	600,000
19	(3) Germany	81.0	18	16	27	131	618,300
20	(5) France	58.0	15	7	14	88	660,000
21	(28) Belgium	10.0	2	2	2	14	714,300
22	(38) Sweden	8.7	1	3	2	12	725,000
23	(8) South Korea	43.3	7	13	5	59	733,900
24	(6) Italy	56.0	12	8	11	75	746,700
25	(47) Costa Rica	3.2	1	0	0	4	800,000
26	(10) Poland	38.0	7	5	4	42	904,800
27	(2) Russian Fed	148.0	26	20	14	159	936,000
28	(27) Kazakhstan	17.0	2	3	4	18	944,400
29	(19) Canada	29.3	3	10	8	30	980,700
30	(1) United States	253.0	42	32	25	257	984,400
31	(12) Spain	39.0	5	6	5	37	1,054,000
32	(11) Ukraine	51.0	7	2	11	43	1,186,000
33	(47) Burundi	5.6	1	0	0	4	1,400,000
34	(42) Yugoslavia	10.4	1	1	1	7	1,485,700
35	(47) Hong Kong	6.1	1	0	0	4	1,525,000
36	(29) North Korea	22.2	2	1	3	13	1,707,700
37	(37) Kenya	25.9	1	4	2	14	1,850,000
38	(35) Great Britain	56.4	1	8	6	26	2,169,200

□ The table includes countries which have won at least one gold and excludes events late last night

TABLE 3

SAT Math Averages by State for 1996

		<u>% Graduates taking SAT</u>
600	Iowa	5%
599	North Dakota	5%
593	Minnesota	9%
586	Wisconsin	8%
575	Illinois	14%
575	Utah	4%
571	Kansas	9%
569	Missouri	9%
568	Nebraska	9%
566	South Dakota	5%
565	Michigan	11%
558	Alabama	8%
557	Oklahoma	8%
557	Mississippi	4%
552	Tennessee	14%
550	Louisiana	9%
548	New Mexico	12%
547	Montana	21%
544	Kentucky	12%
544	Wyoming	11%
538	Colorado	30%
536	Idaho	15%
535	Ohio	24%
521	Oregon	50%
521	Arizona	28%
519	Washington	47%
514	New Hampshire	70%
513	Alaska	47%
511	California	45%
510	Hawaii	54%
508	National	41%
507	Nevada	31%
506	West Virginia	17%
505	New Jersey	69%
504	Massachusetts	80%
504	Connecticut	79%
504	Maryland	64%
500	Vermont	70%
500	Texas	48%
499	New York	73%
498	Maine	68%
496	Virginia	68%
496	Florida	48%
495	Delaware	66%
494	Indiana	57%
492	Pennsylvania	71%
491	Rhode Island	69%
486	North Carolina	59%
477	Georgia	63%
474	South Carolina	57%
473	District of Columbia	50%

TABLE 4

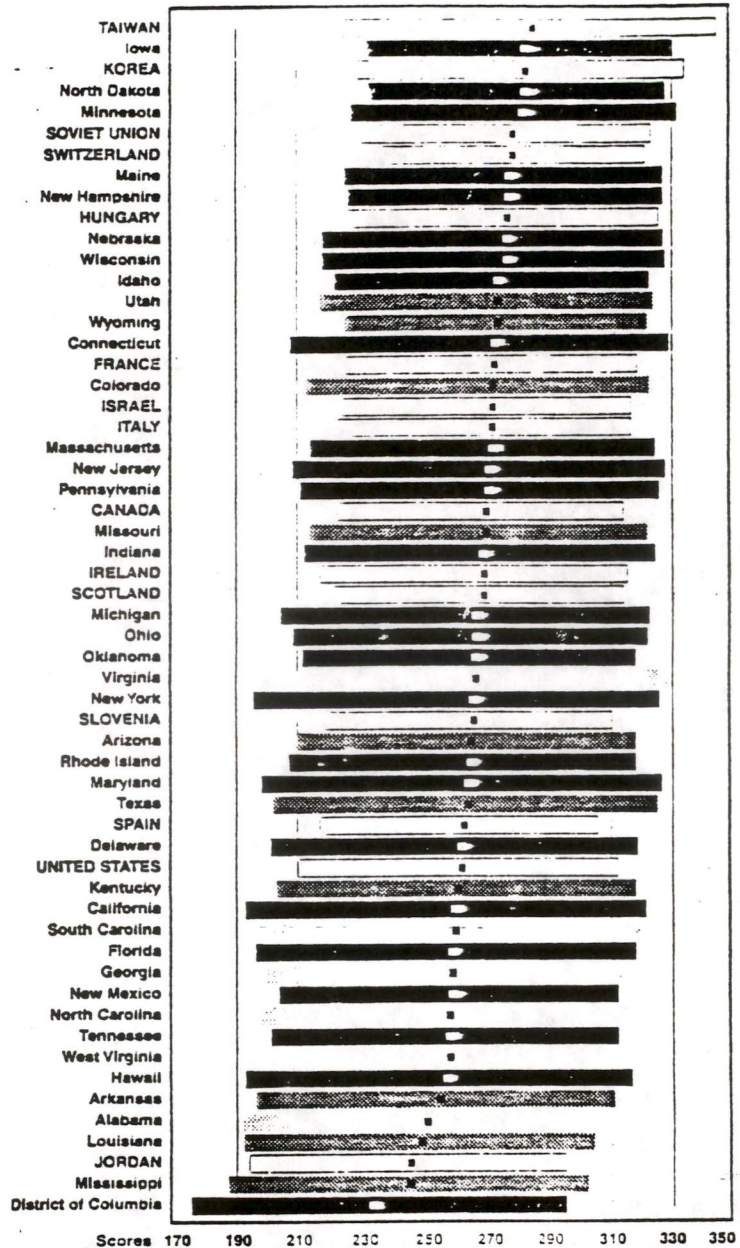
**States Ranked by Mathematics Proficiency
on International Tests, 1992**

**Percent of Children
in Poverty, 1992**

Iowa	12.6
North Dakota	15.2
Minnesota	18.4
Maine	19.3
New Hampshire	10.1
Nebraska	14.4
Wisconsin	14.0
Idaho	17.5
Utah	12.5
Wyoming	13.2
Connecticut	12.8
Colorado	16.3
Massachusetts	16.7
New Jersey	15.1
Pennsylvania	16.9
Missouri	19.5
Indiana	19.7
Michigan	21.8
Ohio	17.5
Oklahoma	21.8
Virginia	13.7
New York	23.3
Arizona	22.0
Rhode Island	15.6
Maryland	14.1
Texas	24.2
Delaware	12.0
Kentucky	24.9
California	22.7
South Carolina	25.1
Florida	24.4
Georgia	23.9
New Mexico	26.8
North Carolina	19.3
Tennessee	26.0
West Virginia	27.9
Hawaii	16.2
Arkansas	24.1
Alabama	23.6
Louisiana	34.5
Mississippi	32.9
District of Columbia	34.4

TABLE 5

Mathematics proficiency scores for 12-year-olds in countries (1991) and public school eighth-grade students (1992), with collective bargaining data for states



Scores 170 190 210 230 250 270 290 310 330 350

Bars show range of test scores between 5th and 95th percentiles.
Possible test scores range from 0 to 500. Small squares indicate average scores.
Shading on bars shows status of collective bargaining:
 ■ States where teachers have right to bargain collectively
 ▨ States that prohibit collective bargaining
 ■▨ States with no legal support for collective bargaining, and where it exists in some localities
 Sources: National Science Foundation/NCES, Data about the U.S. Workforce; AFT.