THE RISKS OF RANKING

IRIS C. ROTBERG Remarks presented at the Philadelphia Federation of Teachers Health and Welfare Fund Educational Conference February, 1997

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

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Turkey New Zealand Belgium Nigena North Korea Jamaca South Afnca Finland Finland Finland Ethiopia Ethiopia Ethiopia Iran Slovakia Slovakia Tugoslavia Argentina Austria Argentina Argentina Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tinnidad&Tobago	4 3 2 2 1 3 3 1 1 2 2 1 1 1 1 0	1 2 1 1 3 1 0 2 1 0 0 1 0 0 1	1 1 2 3 3 2 1 1 1 1 2 1 1 1 1	6 6 6 6 5 4 4 4 3 3 3
New Zealand Belgium Nigena North Korea Jamaica South Afnca Finland Finland Algena Ethiopia Iran Slovakia Algena Ethiopia Iran Slovakia Craatia Argentina Argentina Argentina Argentina Croatia Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tinnidad&Tobago	3 2 2 1 3 3 1 1 2 1 1 1 1 0	2 2 1 1 3 1 0 2 1 0 0 1 1 0 1	1 2 3 2 1 1 1 1 2 1 1 1 1	6 6 6 5 4 4 4 3 3 3
Belgium Nigena North Korea Jamaica South Afnoa Finland Indonesia Akgeria Ethiopia Iran Slovakia Tran Slovakia Croatia Argentina Argentina Argentina Argentina Argentina Croatia Portugal Thailand Namibia Slovenia Malaysia Modova Uzbekistan Georgia Morocco Tinnidad&Tobago	2 2 1 3 1 1 2 2 1 1 1 1 0	2 1 3 1 0 2 1 0 0 1 1 0 1	2 3 2 1 1 1 2 1 1 1 1 1	6 6 5 5 4 4 4 3 3 3 3
Nigena North Korea Jamaica South Athca Ireland Finland Indonesia Akgena Ethiopia Ethiopia Ethiopia Ethiopia Iran Slovakia – Yuqoslavia Argentina Austria Argentina Austria Armenia Croatia Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tinnidad&Tobago	2 2 1 3 3 1 1 2 2 1 1 1 0	1 1 3 1 0 2 1 0 0 1 0 1	3 3 2 1 1 1 2 1 1 1 1	6 6 5 4 4 4 3 3 3
North Korea Jamaca South Afnca Finland Finland Algena Ethiopia Iran Slovakia Slovakia Slovakia Argentina Austria Argentina Croatia Portugal Thailand Namibia Slovania Malaysia Moldova Uzbekistan Georgia Morocco Tinnidad&Tobago	2 1 3 1 1 2 2 1 1 1 0	1 3 1 0 2 1 0 0 0 1	3 2 1 1 1 2 1 1 1 1	6 5 4 4 3 3 3
Jamaica South Africa Ireland Finland Indonesia Algena Ethiopia Iran Slovakia Yugoslavia Argentina Austria Argentina Austria Argentina Croatia Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tinnidad&Tobago	1 3 1 1 2 1 1 1 0	3 1 0 2 1 0 0 1 1	2 1 1 2 1 1 1 1	6 5 4 4 4 3 3 3
South Africa Ireland Finland Indonesia Algeria Ethiopia Iran Slovakia Yugoslavia Argentina Argentina Austria Armenia Croatha Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tinnidad&Tobago	3 3 1 2 2 1 1 1 0	1 0 2 1 0 0 0 1	1 1 1 2 1 1 1	5 4 4 3 3 3
Ireland Ireland Indonesia Algena Ethiopia Iran Slovakia Slovakia Argentina Austria Argentina Austria Armenia Croatia Portugal Thailand Namibia Slovenia Moldova Uzbekistan Georgia Morocco Tinnidad&Tobago	3 1 2 2 1 1 1 0	0 2 1 0 0 1	1 1 2 1 1 1	4 4 3 3 3
Finland Indonesia Algena Ethiopia Iran Slovakia Yugoslavia Argentina Austria Argentina Croatia Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tinnidad&Tobago	1 1 2 1 1 1 0	2 1 0 0 1	1 2 1 1 1	4 4 3 3 3
Indonesia Algena Ethiopia Irran Slovakia Yugoslavia Argentina Austria Austria Austria Croatia Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tinnidad&Tobago	1 2 1 1 1 0	1 0 0 1	2 1 1 1	4 3 3 3
Algena Ethiopia Iran Slovakia Yugoslavia Argentina Austria Austria Austria Austria Croatia Portugal Thailand Dortugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tinnidad&Tobago	2 1 1 1 0	0	1 1 1	3 3 3
Ethiopia Iran Slovakia Slovakia Argentina Austria Armenia Croata Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tiniklad&Tobago	2 1 1 1 0	0 1	1	3
Iran Slovakia Slovakia Yuqoslavia Argentina Austria Argentina Croatia Portugal Thailand Namibia Slovenia Moldova Uzbekistan Georgia Morocco Trinkdad&Tobago	1 1 1 0	1 1	1	3
Slovakia Yugoslavia Argentina Austria Armenia Croatia Portugal Thailand Namibia Slovania Malaysia Moldova Uzbekistan Georgia Morocco Tinnklad&Tobago	1 1 0	1		
Yugoslavia Argentina Austria Austria Croatia Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tinnklad&Tobago	1	_		3
Yugoslavia Argentina Austria Austria Croatia Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tinnklad&Tobago	0	1	_1.	
Argentina Austria Armenia Croatia Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tinnidad&Tobago	-		1	3
Armenia Croatia Portugal Thailand Namibia Slovenia Moldova Uzbekistan Georgia Morocco Trinklad&Tobago	0	2 :	1	3
Armenia Croatia Portugal Thailand Namibia Slovenia Moldova Uzbekistan Georgia Morocco Trinklad&Tobago		1	2	3
Croatia Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Trinklad&Tobago	1	1	0	2
Portugal Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Tinnklad&Tobago	1	1	0	2
Thailand Namibia Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Trinklad&Tobago	1	0	1	2
Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Trinklad&Tobago	1	0	1	2
Slovenia Malaysia Moldova Uzbekistan Georgia Morocco Trinklad&Tobago	0	2	0	2
Malaysia Moldova Uzbekistan Georgia Morocco Trinidad&Tobago	0	2	0	2
Moldova Uzbekistan Georgia Morocco Trinidad&Tobago	0	1	1	2
Uzbekistan Georgia Morocco Trinidad&Tobago	0	1	1	2
Georgia Morocco Trinidad&Tobago	0	1	1	2
Morocco Trinidad&Tobago	0	0	2	2
Trinidad&Tobago	0	0	2	2
	0	0	2	2
	1	0	0	1
Costa Rica	1	0	0	1
	1	0	0	1
Ecuador Hong Kong	1	0	0	1
Hong Kong	1	0	0	1
Syna	0	1	0	1
Azerbaijan	0	1	0	1
Bahamas	0	1	0	1
Latvia		1	0	1
Philippines	0		0	1
Taiwan	0	1		1
Tonga	0	1	0	
Zambia	0	1	0	1
India	0	1	0	1
Israel	0	0	1	1
Mexico			1	1
Mongolia	0	0		
Mozambique	0	0	1	1
Puerto Rico	0	0	1	1
Tunisia Uganda	0	0		_

TABLE 2

When popu Places are bror	lation is the guide, worked out by awar nze, and then dividi	the Atlanta Games ding four points fo ng a country's po	s medals table or a gold, two pulation by it	e looks ve for silver s points t	and one fo otal:
	Country	Pop in Gold million 4 pts	SilverBronze 2 pts 1 pt	Total points	Population per poin
9 (29) 10 (16) 11 (45) 12 (15) 13 (36) 14 (23) 15 (22) 16 (40) 17 (14) 18 (44) 19 (3) 20 (5) 21 (28) 22 (38) 22 (38) 22 (38) 22 (38) 22 (47) 22 (11) 17 (12) 28 (27) 29 (19) 10 (1) 11 (12) 29 (19) 10 (10) 11 (12) 29 (19) 10 (19) 10 (10) 20 (10) 21 (28) 22 (19) 10 (10) 23 (28) 23 (28) 23 (28) 24 (6) 25 (19) 10 (1) 26 (10) 27 (12) 28 (27) 29 (19) 10 (1) 29 (19) 10 (1) 20 (10) 20 (10) 21 (28) 22 (10) 23 (28) 23 (28) 24 (6) 25 (47) 26 (10) 11 (12) 27 (12) 28 (27) 29 (19) 10 (1) 11 (12) 29 (11) 30 (27) 20 (29) 7 (37)	New Zealand Jamaica Cuba Australia Ireland Hungary Denmark Bulgaria Norway Switzerland Slovakia Greece Belorussia Czech Rep Netherlands Finland Romania Armenia Germany France Belgium Sweden Sweden Sweden Sweden South Korea Italy Costa Rica Poland Russian Fød Kazakhstan Canada United States Spain Ukraine Burundi Yugoslavia Hong Kong North Korea Kenya Great Britain	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	7 8 9 20 1 4 9 1 1 1 6 5 1 3 2 0 0 1 4 0 6 8	12 59 75 4 159 18 30 257 37 1 43 1 4 1 7 1 4 1 3 1 1 4 1 1 3 1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 5 9	205,900 208,300 215,700 243,200 269,200 273,700 310,300 330,800 355,000 400,000 416,700 425,000 455,600 578,900 600,000 555,600 578,900 600,000 725,000 725,000 746,700 800,000 94,800 936,000 94,800 944,400 980,700 984,400 984,400 984,400 980,700 984,400 1,86,000 984,400 980,700 984,400 1,86,000 1,86,000 1,86,000 1,86,000 1,80,000 1,80,000 1,80,000 1,80,000 1,80,000 1,80,000 1,80,000 1,80,000 1,80,000 1,80,000 1,92,000 1,92,000 1,92,000

TABLE 3

SAT Math Averages by State for 1996

			% Graduates taking SAT
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%
		National	41%
508		Nevada	31%
507			17%
506		West Virginia	69%
505		New Jersey Massachusetts	80%
504			79%
504		Connecticut	
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%

States Ranked by Mathematics Proficiency on International Tests, 1992	Percent of Children <u>in Poverty, 1992</u>		
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		

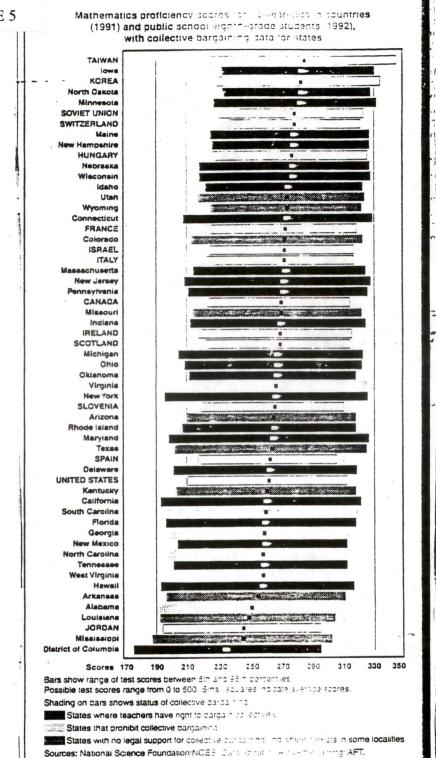


TABLE 5