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ABSTRACT

Changes that have been made in reporting and disseminating information from the National Assessment of Educational Progress are discussed, focusing on those changes brought about by the first Trial State Assessment (TSA). The TSA collected data on the mathematics performance of students in grades 4, 8, and 12 in public and private schools in 40 states. This voluminous material was not well-digested by the media or the public. In contrast, briefer and more focused reports on science achievement and writing achievement were more enthusiastically received and more readily used. The National Center for Education Statistics (NCES) then developed a two-part plan for data release. Part 1 involved data release in smaller portions, and part 2 consisted of improvement of the data presentation. These improvements were initiated with a conference of measurement professionals who planned new comparison charts and better ways of formatting the information. Five figures illustrate some of the new approaches. (SLD)

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THE NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

Changes in Reporting and Dissemination for 1992 and Beyond

Presented by Carol Sue Fromboluti
American Educational Research Association Annual Meeting
April 12, 1993

In June 1991, the National Assessment of Educational Progress (NAEP) released results from the first ever Trial State Assessment. Data were released on the performance of eighth grade public school students in 40 states and the national data were released on students in grades 4, 8, and 12 in both public and private schools. There was a mountain of information on how and what students learn in mathematics. The report was 530 pages long and over 1 1/4" thick. We released data on the traditional NAEP reporting categories for the nation **and the states**, which included average proficiency by race/ethnicity, gender, type of community, region, type of school, and parents' highest level of education. Along with this we reported:

- proficiencies in various content areas and detailed
- descriptions of students' mathematical abilities, course taking patterns (vital to an understanding of math proficiencies)
- students performance on constructed-response questions in various content areas
- instructional approaches such as ability grouping and the use of instructional materials
- students use of computers and calculators in school
- instructional time and emphasis
- students perceptions and personal experiences, and
- information on mathematics teachers

We thought this information would keep researchers, policymakers,

and educators busy for several years. But, we were disappointed in the use that was made of this voluminous material. Reporters concentrated on the horse-race aspects of the Trial State Assessment, and researchers and policymakers moved on to the next report, rather than continuing to mine the data from this one. In fact, we were so busy getting the next series of reports ready that we didn't immediately look back either.

The next reports came out in the Spring of 1992. NAEP released *The Science Report Card, Reading In and Out of School, and Exploring New Methods for Collecting Students' School Based Writing*. These reports were all about 100 pages long and focused on a very limited content area. Surprisingly, we received tremendous press coverage and intense interest from data users on all three of these reports. Pound for pound, these reports were better exploited than the comprehensive mathematics report. Less was more.

Meanwhile, back at NCES we were in the process of collecting volumes of data for the 1992 TSA in mathematics and reading. We knew there was a demand for the data, but how could we improve its impact and make it more accessible? The volume of the 1990 TSA was simply too intimidating. We didn't want to repeat this mistake in 1992.

As a result, we developed a two part plan. Part I was a plan for the release of the data. Rather than put out volumes of information all at once, we decided to release smaller, more

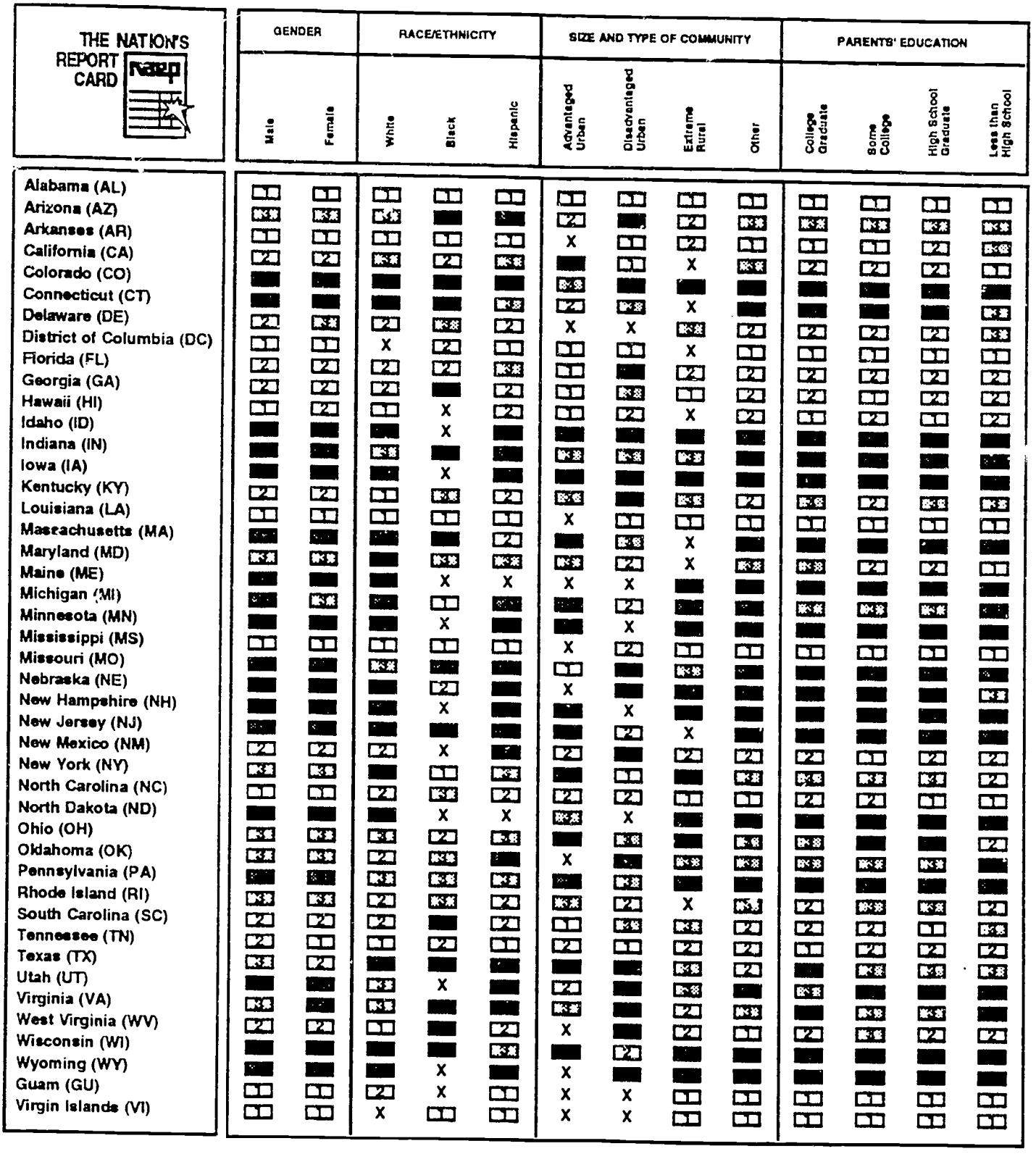
focused reports, scattered across several months. The first release of the TSA in mathematics would concentrate on proficiency and achievement levels in the traditional NAEP reporting categories. And because we were adding achievement levels, where previously we had reported at anchor points using scale scores, we decided to also release a supplemental report that would explain some of the ways that NAEP scores can be interpreted. This release would answer the question of "how US students are performing in mathematics" and how to judge that performance.

Subsequently, we would release smaller, more focused reports on critical aspects of mathematics education that NAEP collected. Several reports were planned: one on students' opportunities to learn mathematics -- course offerings and content. Since there is so much interest in alternative assessments and NAEP has been at the forefront of this effort, a second focused report was planned to discuss students' responses to constructed response items. We also planned to release the reading results in a similar manner with focused reports on the supplemental material.

Part I of the strategy was to phase the release of information to concentrate attention on the substance of the data collections. Part II of the strategy was to look into how to improve the **presentation** of the data. In the summer of 1992 we, therefore, called together representatives from a wide range of organizations for brainstorming sessions on how to improve the NAEP reporting formats. Rather than a homogeneous group, we called together

FIGURE 2.1
(cont.)

Average Overall Mathematics Proficiency by Selected Demographics for Five Performance Bands (Quintiles) 1992 Grade 8



Quintiles of Performance

bottom 20 percent — top 20 percent

1st 2nd 3rd 4th 5th

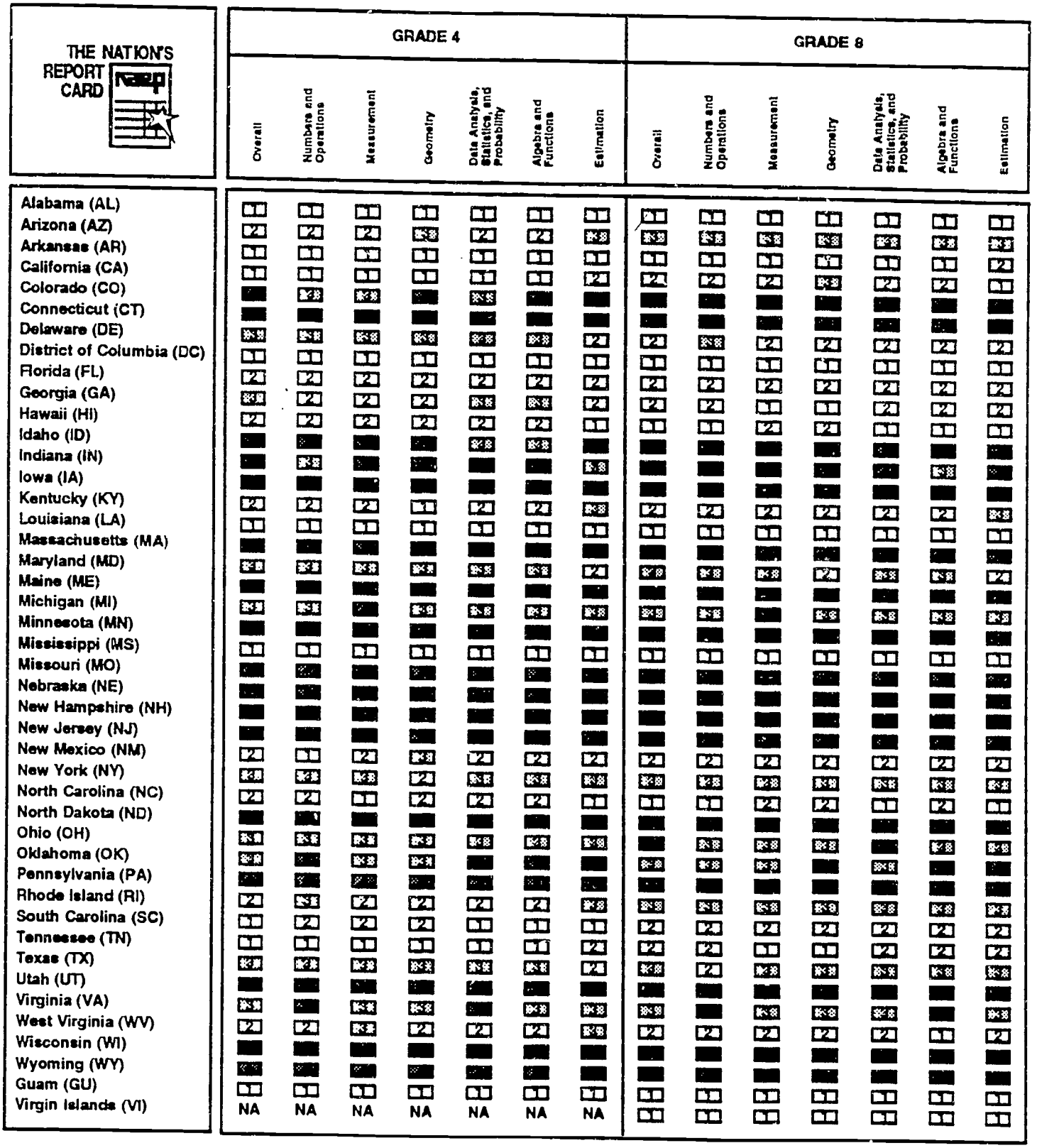
lower ← proficiency → higher

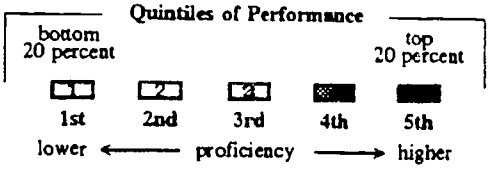
States categorized in the bottom 20 percent of performance have average mathematics proficiencies in the lowest fifth of the average mathematics proficiency distribution of all states and are indicated by the number 1 (first quintile). States with average proficiencies in the top 20 percent of the distribution are indicated by the number 5 (fifth quintile). The numbers 2, 3, and 4 indicate states with average proficiencies in the second, third, and fourth fifths of the distribution.

X Sample size too small (fewer than 62 students) to permit reliable reporting of performance bands (quintiles).

FIGURE 7

Average Proficiency by Mathematics Subscales for Five Performance Bands (Quintiles) 1992 Grades 4 and 8





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NA Grade 4 data for the Virgin Islands are not available.

representatives from other federal agencies, researchers, educators, teachers, state representatives, and education associations. The results were stimulating. These groups suggested innovative ideas on how to improve our reporting and formatting. Eugene Johnson from ETS was present at one of the meetings, and as the group mulled through a new idea on how to report the data, he doodled away. By the next day when he was back in Princeton, he had started to implement one of these ideas. He was responding to a suggestion by the group that a consumer report type chart that would show states proficiencies at delivering different educational variables could be useful. With such a chart you would be able to look at average mathematics proficiency in the five content areas, or how different types of students perform in the states relative to the same types of students in other states.

(Table 2.1) For example, Colorado does very well on average, but less well for advantaged urban students. On the other hand, California is in the top 20 percent for its advantaged urban students, but lower in lower categories for students in disadvantaged urban or rual areas.

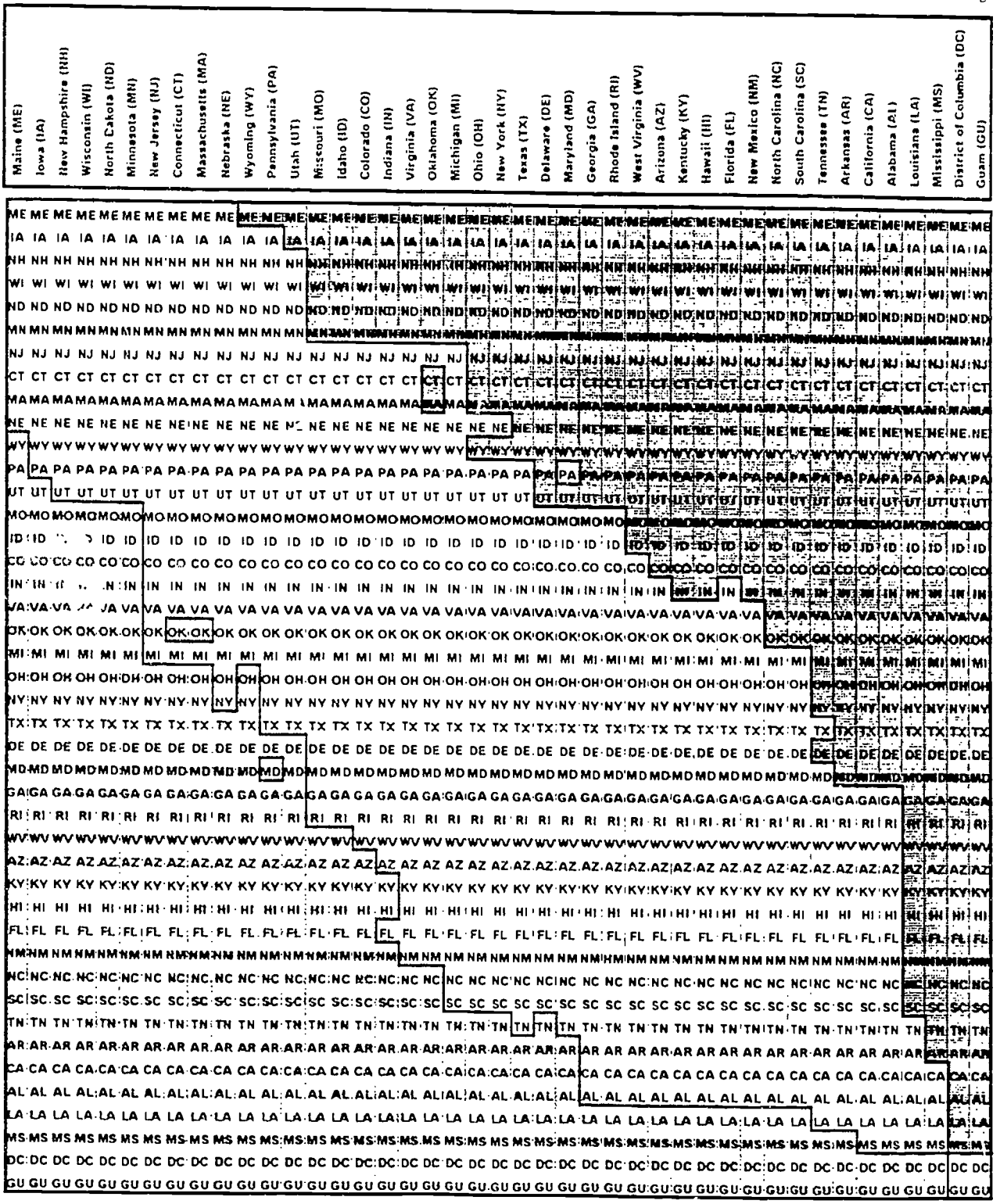
(Table 7) Similarly, you can see that most states are relatively consistent in the delivery of mathematics across the five content areas, but the chart helps you readily visualize the states where delivery is not consistent. For example, California seems to do relatively well in geometry as compared with the performance in numbers and operations, measurement, data analysis, algebra, and

FIGURE 1

Comparisons of Overall Mathematics Average Proficiency 1992 Grade 4

THE NATION'S REPORT CARD

INSTRUCTIONS: Read *down* the column directly under a state name listed in the heading at the top of the chart. Match the shading intensity surrounding a state postal abbreviation to the key below to determine whether the average mathematics performance of this state is higher than, the same as, or lower than the state in the column heading.



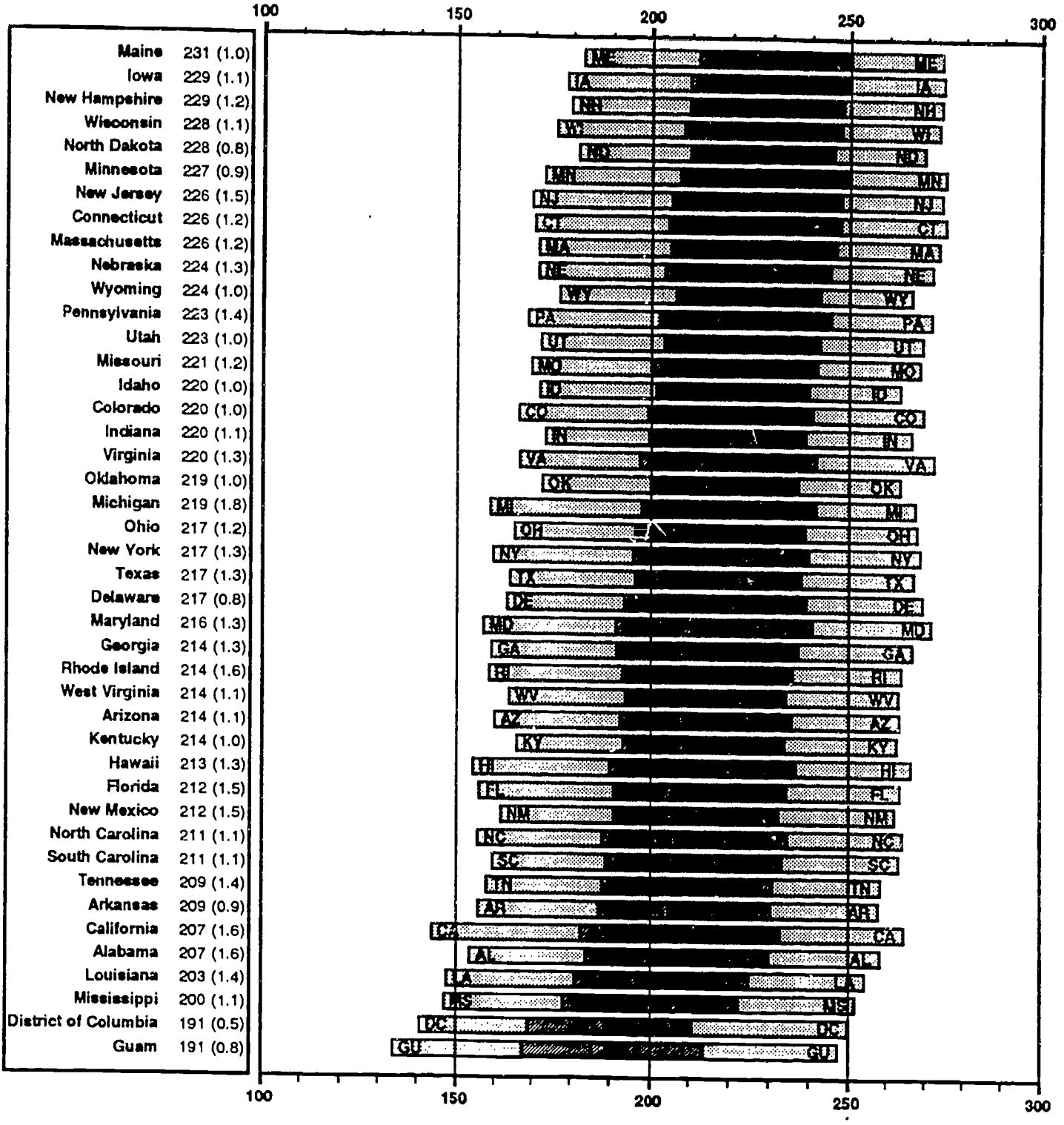
- State has statistically significantly higher average proficiency than the state listed at the top of the chart.
- No statistically significant difference from the state listed at the top of the chart.
- State has statistically significantly lower average proficiency than the state listed at the top of the chart.

The between state comparisons take into account sampling and measurement error and that each state is being compared with every other state. Significance is determined by an application of the Bonferroni procedure based on 946 comparisons by comparing the difference between the two means with four times the square root of the sum of the squared standard errors.

FIGURE 2

Distribution of Overall Mathematics Proficiency Organized by Average Proficiency
1992 Grade 4

THE NATION'S REPORT CARD



Percentiles of Performance

5th 25th 75th 95th

Mean and confidence interval

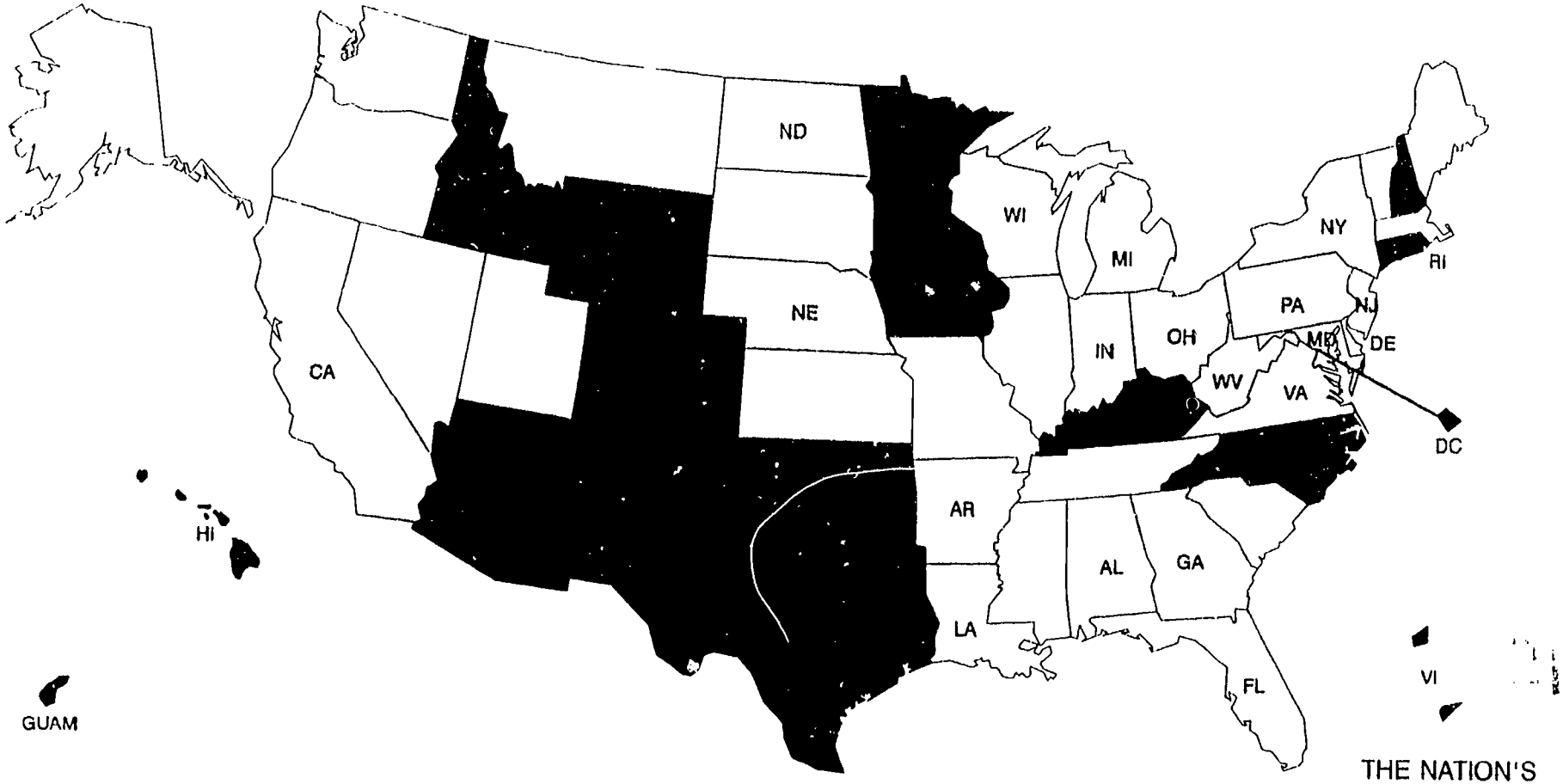
The center *darkest* box indicates a simultaneous confidence interval around the average mathematics proficiency for the state based on the Bonferroni procedure for multiple comparisons. Center boxes that do not overlap indicate significant differnces between between states in average mathematics proficiency. The *darker shaded* boxes indicate the ranges between the 25th and 75th percentiles of the mathematics proficiency distribution, and the *lighter shaded* boxes the ranges between the 5th to 25th percentiles and the 75th to 95th percentiles of the distribution.

Figure 5

The NAEP Trial State Assessment

Comparisons of Overall Mathematics Proficiency at Grade 8

1992 vs. 1990



State was significantly higher in 1992 than 1990

No statistically significant difference from 1990 to 1992

State did not participate in 1990 or 1992

NOTE: No state was significantly lower in 1992 than 1990

THE NATION'S REPORT CARD

1992 Trial State Assessment

estimation in that state.

We talked at length about the Bonferroni multiple comparison chart, and the consensus among our data users was that it was necessary, accurate, we had used it before and should stay with it. People would get used to it. However, to make it more readable across the lines, we added the state letters.

These groups also suggested a map showing the same information as contained in the multiple comparison chart. ETS developed two maps to illustrate these differences among states. One map for each state shows in which states performance is the same, better than, or worse than, the state that is the focus for the map. Another chart shows changes from 1990 and 1992. These are simply different ways of illustrating information that was already available, but we think that they make the information much more accessible and understandable to more people.

There were many more suggestions for improving the reporting and formatting of information from the National Assessment of Educational Progress. Some are excellent, like the request for a directory of where to find NAEP information in the many reports, but we don't have the resources at the moment to implement all of them. We have made every effort to improve not only the NAEP data, but its usefulness to its expanding audience of data users. We welcome any more suggestions or comments you might want to offer.