Using State Assessments to Impute Achievement of Students Absent from NAEP:
An Empirical Study in Four States

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The NAEP Validity Studies (NVS) Panel was formed in 1995 to provide a technical review of NAEP plans and products and to identify technical concerns and promising techniques worthy of further study and research. The members of the panel have been charged with writing focused studies and issue papers on the most salient of the identified issues.

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Introduction

NAEP student absence rates vary from state to state and year to year, but on average roughly five percent of students selected for NAEP are absent from NAEP assessment sessions and are not picked up in a make-up session. These are in addition to the roughly five percent of students who are excluded from the standard NAEP estimates because they are students with disabilities or English language learners who are considered unable to participate meaningfully in the assessment. In preparing estimates for state-level statistics, NAEP has employed different standard procedures in dealing with missing data for absent and excluded students. Absent students have been considered part of the population of reference for those estimates, so adjustments have been made to the NAEP data in order to compensate. Exclusions, on the other hand, have been ignored.

To adjust for estimates of achievement for absent students, a basis is needed for imputing plausible achievement scores for those students. Ideally, one would use scores on a parallel test; in lieu of available test scores, NAEP has used demographic proxies for achievement. That is, absent students are assumed to have achievement similar to demographically similar students who are not absent. Demographic proxies are clearly less accurate than actual achievement scores on a related test, but until now, achievement test scores have not been systematically available for students selected for NAEP. Recent advances in database management have now made state assessment scores available for uses such as this. The purpose of this study is to estimate the extent to which state assessment scores can be used to improve the adjustments of NAEP data to remove the biases due to absences.

A simulation study was conducted to explore the potential of state assessment scores to improve adjustments for nonparticipation (McLaughlin, Gallagher, and Stancavage, 2004). That study found that state assessment scores could potentially be more effective than demographic information in removing the bias related to absences. The present study aims to extend that simulation by empirically assessing the potential for using state assessment scores to impute achievement for NAEP absent students in four states. In these four states, state assessment scores were acquired for students selected to participate in the NAEP reading and mathematics assessments in 2003.

Four research questions have guided the course of this study:

1. How well do state assessment scores cover absent students?
2. Do state assessment scores follow the patterns of NAEP scores?
3. How do results of adjustments for absences based on state test data compare to current demographic adjustments for absences?
4. Is the use of state assessment data for this purpose feasible?

1. How well do state assessment scores cover absent students?

If NAEP plans to use state assessment scores for imputation of achievement of students absent from the NAEP sample, there needs to be some assurance that these state assessment scores exist. If the same causes of NAEP absences led to absences when the state assessment was measured, then acquiring the available state assessment scores would be of no use in estimating the NAEP performance of absent students.

There are two categories of missing NAEP scores. The first category is exclusions related to students' disabilities, or, if they are English language learners, limitations in their fluency in English. The second category is absences, including ones that are temporary, long term, or chronic, due to suspension, in-school non-participants, disruptive behavior, parental refusal, student refusal, or other reasons. Students who are excluded from NAEP (as opposed to absences) are much more likely than

other students to be given alternative assessments, resulting in missing state assessment scores on the regular state assessment files. However, because AIR has developed methods for imputing NAEP achievement for excluded students based on teacher questionnaires about their achievement (McLaughlin, 2003), the need for information about missing scores is most urgently needed for missing scores due to absences.

NAEP currently uses demographic information to adjust for student absences, reassigning the weights of absent students to the records of demographically similar students for whom scores are available. If state assessment scores can be acquired for just a fraction of the students absent from NAEP, then demographic adjustments can be used for the other students. However, if the fraction with state assessment scores is small, the value of the state scores might not be worth the effort in acquiring them.

2. *Do state assessment scores follow patterns of NAEP scores?*

If NAEP plans to use state assessment scores to assist in the imputation of achievement of students absent from the NAEP sample, there must be assurance that the state assessment information is relevant to NAEP. If state assessment scores are unrelated to NAEP, then imputing NAEP achievement from the state assessment scores would be inappropriate.

The primary criterion measure for determining the extent to which state assessment scores can be taken as indicators of NAEP achievement is the correlation between them. That correlation can only be measured for students with both test scores, so the assurance is based on the assumption that the relation measured by the correlation for students with both test scores will generalize to absent students as well.

3. *How do results of adjustments for absences based on state test data compare to current demographic adjustments for absences?*

Because this is an empirical study, as opposed to a simulation, we cannot know whether the nonresponse adjustment made by using state assessment scores is accurate. However, we can compare the adjustment to the standard demographically based adjustments that NAEP currently makes to minimize student nonresponse bias.

In the simulation preceding this study (McLaughlin, Gallagher, and Stancavage, 2004), the general finding was that, in the presence of substantial nonresponse bias, the use of state assessment scores is likely to remove a greater percentage of the nonresponse bias than use of demographic information alone.

4. *Is the use of state assessment data for this purpose feasible?*

In order for state assessment data to be used for this purpose, it is necessary for states to be willing and able to share state assessment data for individual students in a timely manner and without compromising the confidentiality of either NAEP or state assessment scores.

Methods

NAEP Data

The database for this study consists of records from the 2003 NAEP grade 4 and grade 8 reading and mathematics assessments for four states. State assessment files were matched to the NAEP records to retrieve state reading and mathematics assessment scores for each student. Excluded students were matched as a part of the process, but they are not included in this analysis, since (1) their achievement can be imputed based on teacher questionnaire responses, and (2) they were frequently provided extra accommodations or an alternative assessment in the state's program, limiting both the availability and validity of state assessment scores for use in imputing NAEP achievement. All results in this report are for the non-excluded NAEP population.

NAEP data were taken from two sets of files: (1) a file of the originally selected sample, including absent students with weights representing the population, and (2) a file of cases used for standard NAEP reporting with weights adjusted to minimize nonresponse bias. Every record on the second file was also on the first file, and every record on the second file, except for excluded students, had a set of NAEP plausible values for reading or mathematics achievement.

Nearly all NAEP records were matched in this study. Across the four states and four assessments, there were 66,128 records of students who participated in the assessment and 4,349 records of students who were absent. Of the former, all but 72 were matched to state assessment records (an average match rate of greater than 99.8 percent), and of the latter, all but 12 were matched to state assessment records (an average match rate of greater than 99.7 percent). It should be noted that although there was a very high success rate for the matching process, there were nevertheless a substantial number of matched records with missing state assessment scores. Total counts by state are shown in tables in the appendix.

State Assessment Data

Because in practical use, time constraints are likely to dictate the need for state assessment scores from the prior school year, we attempted to acquire grade 3 and grade 7 state assessment scores. However, because not all states implemented reading and mathematics assessments in grades 3 and 7 during the years of the study, we used grade 4 and 8 scores where necessary. A brief summary of each state's tests follows.

Scaled scores for State 1 are from the 2002 and 2003 State 1 Student Assessment (S1SA) in English/language arts and mathematics at fourth and seventh grade. The S1SA is a criterion-referenced test that uses three item types: selected response (multiple-choice), short constructed response, and extended constructed response. We also collected ITBS scores in reading and mathematics for the third grade.

For State 2, mathematics and English/language arts test scores are available for grades 3 and 7 for 2001-2002 and 4 and 8 for 2002-2003. The primary statistics in this report are based on the grades 3 and 7 state assessment scale scores. All test items used a multiple-choice format. Calculators were allowed for most of the math items at both grade levels.

For State 3, English/language arts test scores are available for grades 3 and 7 for 2001-2002 and grade 4 for 2002-2003. Mathematics scores are available for grades 4 and 8 in 2002-2003. The primary statistics in this report are based on grades 4 and 7 for reading and 4 and 8 for mathematics.

State 4 reported scaled scores from the state's criterion-referenced Assessment of Student Competence in Reading/English/Language Arts and Mathematics from the 2003 administration at the fourth and eighth grades. Scores were not available for grades 3 and 7 in 2002.

Analyses

The first step was to confirm the matches. NAEP pre-assigns a booklet ID for each student, but in some cases a different booklet is assigned on assessment day to allow for certain types of accommodations. For this reason, some records on the NAEP sample file had two separate booklet identification codes, and which of these was used in the step of matching to the state assessment file was not completely uniform. This needed to be reconciled during the match confirmation step.

Following the match confirmation step and an evaluation of the size of current NAEP student nonresponse adjustments, we carried out analyses to address the first three research questions.

The primary method we used for nonresponse adjustment in this study was to impute values for the absent students. For the purposes of this study, this is mathematically equivalent to assigning the "weight" of absent students to other students who do have values on the NAEP achievement scale. Weights used were STUSAWT0 for the original sample file and ORIGWT (the standard NAEP weight) for the plausible value file.

To impute NAEP means for students with state scores and no NAEP scores, we assigned a value whose distance from the mean NAEP score was equal to the distance of the student's state assessment score from the mean state assessment score in standard deviation units. The state means and standard deviations used in this calculation were based on students with scores on both tests. That is, the first step was to compute the mean and standard deviation of both NAEP plausible values (using plausible value set #1) and state assessment scores for students with both test scores. The second step was to compute the mean of the state assessment scores for students absent from NAEP, and to translate this into a number of standard deviations (z) of difference from the mean for the students with both scores. The final step was to apply that difference (z) to the mean NAEP score obtained in step 1, to obtain an estimate of the achievement of NAEP absent students who have state assessment scores. While this computation does not require that NAEP and state assessment scores be correlated, the result would not be valid unless those scores are highly correlated.

We did not use available demographic information in this imputation, although if the use of state assessment scores for this purpose were implemented operationally in NAEP, that demographic information would also be used.

To compare the proposed nonresponse adjustments with current nonresponse adjustments, it is necessary to take the students with neither test score into account. To obtain NAEP scores for the category of student records with neither test score, we used demographic information. Specifically, we substituted the mean score, among those with NAEP scores, for students with the same characteristics in the same state: minority or white, eligible or ineligible for free lunch, disability/English language learner or not.

The relationship between NAEP and state assessment scores may vary between demographic groups, resulting in different adjustments for different groups. To study this possibility, proposed adjusted scores were compared to current adjusted scores and unadjusted scores for demographic subgroup means (i.e., White, Black, and Hispanic) as well as for overall means. Even though differences in overall state assessment means between students present and absent from NAEP might be small, those differences might be substantial for subgroup means.

Another question concerns the relationship between types of nonparticipation and the need for nonresponse adjustments. First, it is known that nonparticipation of students with disabilities and English language learners due to selective exclusion from NAEP has a much greater impact on overall NAEP means than nonparticipation due to absences. However, as discussed above, adjustments for exclusions (which NAEP can address by using teacher ratings and other information on the NAEP SD/LEP questionnaire for plausible value imputation) do not require state assessment information and are not included in this study. Moving beyond exclusions, NAEP records ten different categories of absence, and although the numbers of cases in most of the individual categories are tiny, they can be combined into three super ordinate categories: (1) temporary absences, (2) parental refusals, and (3) absences indicative of poor school performance (e.g., chronic absences, suspensions).

Finally, to check the assumption that imputing scores for absent students would produce essentially the same results as reassigning the weights of absent students to students with scores, we constructed an alternative state assessment adjustment by dividing state assessment scores into deciles and reassigning the weight of students absent from NAEP, but with state assessment scores, to other students with NAEP scores in the same state assessment decile. Demographic weight adjustments (for absent students with neither score) were constructed similarly.

Results

Based on the simulations of worst case scenarios, we had estimated that with an absence rate of 5 percent, the required adjustment to state means could be as much as 2 to 3 NAEP points. The worst case assumption was that the absent students would be the lowest scoring student(s) in each school sample. If absences were all random, due to sporadic childhood illnesses, then no adjustment would be needed.

If the standard NAEP nonresponse adjustments are accurate for the 2003 NAEP assessments, it appears that the assumption of randomness is much closer to reality than is the worst case assumption. As shown in figure 1, the median adjustment is 0.1 NAEP point for grade 4 and 0.3 NAEP point at grade 8, in both cases much less than the standard error estimate for state means.

Figure 1. Frequencies of standard NAEP nonresponse adjustments to state means in 2003, by subject and grade
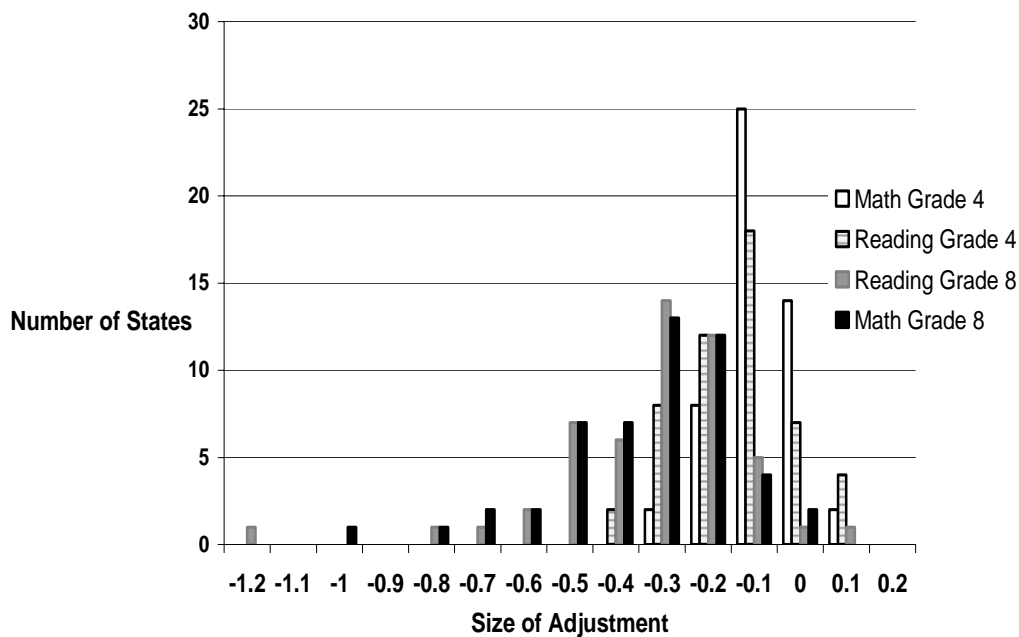
Source: National Assessment of Educational Progress: 2003.

1. *How well do state assessment scores cover absent students?*

The first research question of interest is the extent to which state assessment scores are available for students selected for but absent from NAEP. The results are shown in tables 1 (for mathematics) and 2 (for reading). Generally, across these four states, the (weighted) percentages of absent students ranged from 4.0 percent to 9.3 percent of the population, while the percentages of absent students without state assessment scores ranged from 0.4 percent to 2.0 percent, when state assessment scores for the same grade were matched, or from 0.7 percent to 3.2 percent, when state assessment scores from the previous grade were matched.

Whether the source of state assessment scores was for the same or for the previous grade caused a small but noticeable difference in coverage of NAEP absences. Using state assessment scores for the same grade, the percentages of the NAEP absent student populations covered by state assessment scores ranged from 70 percent (4.8 / (4.8 + 2.0)), for grade 8 math in state 4, to 94 percent (6.0 / (6.0 + 0.4)), grade 4 reading in state 3, with a median of 80 percent. When state assessment scores for the previous grade were used, the coverage of the NAEP absent populations ranged from 61 percent, for grade 7 math in state 1, to 88 percent, for grade 3 reading in state 3, with a median of 74 percent.

Generally, the absence rates were roughly 50 percent greater for the eighth grade NAEP assessments than for the fourth grade assessments, so coverage of eighth grade absences would have greater impact than coverage of fourth grade absences, other things equal. However, there was no systematic difference in state assessment coverage of NAEP absences between grades 4 and 8 across the four states. Finally, there was some variation in coverage among states: adjusting for the differences in state assessment grades available in each state, the average coverage of NAEP absences was nearly 90 percent coverage in state 3, while the average coverages in the other states were between 73 percent and 77 percent.

Table 1. Percentage of the NAEP non-excluded mathematics sample, by availability of NAEP and state assessment scores, in four states in 2003

	State 1		State 2		State 3	State 4
NAEP Grade 4						
State Assessment Grade:	**3**	**4**	**3**	**4**	**4**	**4**
Students with both NAEP and state scores	69.6	78.8	73.3	76.2	89.2	80.1
Students having only NAEP scores	26.4	17.2	21.7	18.8	5.0	15.0
Students having only State scores	2.8	3.1	3.5	3.8	5.4	4.0
Students having neither NAEP nor State scores	1.2	0.9	1.5	1.2	0.4	0.8
NAEP Grade 8						
State Assessment Grade:	**7**		**7**	**8**	**8**	**8**
Students with both NAEP and state scores	72.1		80.3	83.2	87.4	73.3
Students having only NAEP scores	19.8		12.7	9.8	3.3	19.9
Students having only State scores	4.9		5.5	5.8	8.2	4.8
Students having neither NAEP nor State scores	3.2		1.5	1.2	1.1	2.0

Note: Percentages are weighted to represent the non-excluded student populations in the state.

Table 2. Percentage of the NAEP non-excluded reading sample, by availability of NAEP and state assessment scores, in four states in 2003

	State 1		State 2		State 3		State 4
NAEP Grade 4							
State Assessment Grade:	**3**	**4**	**3**	**4**	**3**	**4**	**4**
Students with both NAEP and state scores	71.2	79.9	77.7	82.0	86.4	90.2	83.8
Students having only NAEP scores	24.1	15.3	18.1	13.8	7.3	3.5	11.7
Students having only State scores	3.5	3.6	3.2	3.3	5.6	6.0	3.7
Students having neither NAEP nor State scores	1.3	1.1	1.1	0.9	0.7	0.4	0.8
NAEP Grade 8							
State Assessment Grade:	**7**		**7**	**8**	**7**		**8**
Students with both NAEP and state scores	72.3		84.1	87.7	84.7		74.3
Students having only NAEP scores	19.8		8.9	5.3	6.3		19.0
Students having only State scores	5.2		5.3	5.6	7.8		4.9
Students having neither NAEP nor State scores	2.6		1.7	1.4	1.3		1.8

Note: Percentages are weighted to represent the non-excluded student populations in the state.

2. Do state assessment scores follow patterns of NAEP scores?

The second research question concerns whether state assessment scores are relevant to NAEP achievement. The results, as shown in table 3, indicate that state assessments in these four states are highly correlated with NAEP, with correlations ranging from .715 to .827 for mathematics and from .653 to .779 for reading. These correlations have not been corrected for the unreliability of the two measures.

Table 3. Correlation between state test score and NAEP mean composite plausible value

Subject	NAEP grade	State grade	State 1	State 2	State 3	State 4
Mathematics	4	3	.768	.811	—	—
		4	.715	.827	.760	.758
	8	7	.787	.823	—	—
		8	—	.824	.819	.768
Reading	4	3	.698	.744	.710	—
		4	.653	.779	.684	.695
	8	7	.675	.708	.717	—
		8	—	.714	—	.691

Source: National Assessment of Educational Progress: 2003. State assessment scores were provided by state education agencies for this study.

The correlations are noticeably greater for mathematics than for reading, and there is noticeable variation between states, with a median correlation of .80 in state 2, compared to about .72 in the other states. The most surprising aspect of the distribution of correlations is the lack of a systematic across-state pattern of lower correlations for adjacent-grade comparisons than for same-grade comparisons. In states 1 and 3, the adjacent-grade correlations are slightly greater, while in state 2, the same-grade correlations are slightly greater. Both same-grade and adjacent-grade state assessment scores are relevant to the problem of estimating the achievement of NAEP absent students.

3. How do results of adjustments for absences based on state assessment data compare to current demographic adjustments for absences?

Since the state assessment scores are both available and relevant to NAEP achievement, we proceed to assess the effects of using the state assessment scores to impute the achievement of students absent from NAEP. For each of the 23 pairings of NAEP and state assessment scores indicated by correlation entries in table 3, we imputed the NAEP means for NAEP absent students with state assessment scores and used those results to estimate overall NAEP means for each state. We compared the results to both unadjusted means (which ignore the absence of students) and the standard NAEP estimates, which adjust for absences by reassigning their weight to demographically similar students who were not absent. As noted above, for the relatively small number of cases with neither NAEP nor state assessment scores, we imputed achievement demographically.

The results, which are presented in 23 tables in the appendix, are summarized in table 4 (for mathematics) and table 5 (for reading). Each of the tables in the appendix displays two sets of computations: (1) based on imputations of scores for all (non-excluded) students selected for the NAEP samples and (2) based on the standard NAEP files, with the standard NAEP demographic adjustments for absences.

The obvious result is that these nonresponse adjustments are very small, as might be expected after viewing figure 1, and it makes little difference in the overall mean how the adjustments are made. At grade 4, the corrections are negligible, and at grade 8, they are less than one NAEP point. At grade 8, there is an indication that the use of state assessment scores might lead to a larger nonresponse adjustment than use of demographics. However, except for grade 8 reading in state 3, the differences are no greater than one quarter of a NAEP point.

Table 4. Comparison of NAEP mathematics means with demographic and state assessment adjustments, by state: 2003

Type of adjustment for absences		State 1		State 2		State 3	State 4
NAEP Grade 4							
No adjustment	Mean	238.1		242.1		241.8	230.3
	SD	27.4		26.6		27.0	29.2
Standard demographic adjustment	Mean	238.1		242.1		241.8	230.3
	SD	27.5		26.7		27.0	29.3
State assessment grade:		**3**	**4**	**3**	**4**	**4**	**4**
State assessment adjustment	Mean	238.1	238.2	242.0	242.0	241.8	230.3
	SD	27.3	27.2	26.5	26.6	27.0	29.1
NAEP Grade 8							
No adjustment	Mean	281.6		281.6		287.1	269.9
	SD	35.8		36.3		34.8	37.2
Standard demographic adjustment	Mean	281.2		281.2		286.7	269.6
	SD	36.0		36.4		34.9	37.3
State assessment grade:		**7**		**7**	**8**	**7**	**8**
State assessment adjustment	Mean	281.1		281.0	281.1	286.6	269.5
	SD	35.6		36.2	36.2	34.7	36.9

Source: National Assessment of Educational Progress: 2003. Excluded students with disabilities and English language learners are not "absent" and are not included in these analyses.   State assessment scores were provided by state education agencies for this study.

Table 5: Comparison of NAEP reading means with demographic and state assessment adjustments, by state: 2003

Type of adjustment for absences		State 1		State 2		State 3		State 4
Grade 4								
No adjustment	Mean	221.1		221.0		227.6		213.7
	SD	35.0		35.2		33.2		37.7
Standard demographic adjustment	Mean	221.1		220.9		227.3		213.7
	SD	35.0		35.3		33.3		37.8
State assessment grade:		**3**	**4**	**3**	**4**	**3**	**4**	**4**
State assessment adjustment	Mean	221.2	221.2	220.9	220.9	227.4	227.4	213.7
	SD	34.8	34.8	35.1	35.1	33.0	33.0	37.7
Grade 8								
No adjustment	Mean	264.1		261.6		273.5		257.8
	SD	34.3		32.9		34.2		34.8
Standard demographic adjustment	Mean	263.9		261.5		273.3		257.5
	SD	34.3		33.0		34.3		35.0
State assessment grade:		**7**		**7**	**8**	**7**		**8**
State assessment adjustment	Mean	263.7		261.3	261.2	272.7		257.4
	SD	34.1		32.9	33.0	34.2		34.9

Source: National Assessment of Educational Progress: 2003. Excluded students with disabilities and English language learners are not "absent" and are not included in these analyses. State assessment scores were provided by state education agencies for this study.

The adjustments based on state assessment scores for adjacent grades are essentially the same as the adjustments based on state assessment scores for the same grade as the NAEP assessment. Thus, based on coverage, based on correlations, and based on the size of the mean adjustment, it matters little whether available state assessment scores are for the same grade or the previous grade.

Given the small size of the overall mean effects of absences, we proceeded to examine effects of absences on subgroup scores and to analyze the state assessment scores of students with different types of NAEP absences. For those analyses, for convenience, we selected a single grade for each state when there were multiple grade possibilities. For state 2, the subsequent analyses are based on use of adjacent grade (i.e., grades 3 and 7) state assessment scores, and for states 1 and 3, the subsequent analyses are based on use of same grade (i.e., grades 4 and 8) scores.

Subgroup means. Although the results indicate that very small adjustments to overall means are needed for nonparticipation, it is possible that more substantial adjustments (and differences between adjustments) are needed for subgroup means. To investigate this, we computed means corresponding to those in tables 4 and 5 separately for Black, White, and Hispanic students. The results are presented in tables 6 and 7.

Table 6. Comparison of NAEP mathematics means with demographic and state assessment adjustments, for Black, White, and Hispanic students: 2003

Demographic group / type of adjustment	Grade	State 1	State 2	State 3	State 4
White		(n=2,822)	(n=2,735)	(n=2,646)	(n=2,214)
No adjustment		241.7	251.3	247.4	241.2
Standard demographic adjustment	4	241.8	251.3	247.3	241.3
State assessment adjustment		241.7	251.2	247.3	241.2
		(n=2,130)	(n=2,383)	(n=2,446)	(n=1,664)
No adjustment		285.1	293.8	292.9	284.2
Standard demographic adjustment	8	284.8	293.7	292.6	283.9
State assessment adjustment		285.0	293.3	292.3	283.7
Black		(n=220)	(n=1,769)	(n=1,018)	(n=2,948)
No adjustment		223.1	224.8	222.1	217.3
Standard demographic adjustment	4	222.9	224.7	222.0	217.2
State assessment adjustment		223.0	224.8	222.1	217.2
		(n=165)	(n=1,455)	(n=784)	(n=2,626)
No adjustment		262.2	260.3	259.8	250.1
Standard demographic adjustment	8	261.9	259.9	259.6	249.8
State assessment adjustment		261.6	259.6	259.7	249.7
Hispanic		(n=458)	(n=335)	(n=836)	(n=307)
No adjustment		222.5	234.6	222.7	219.1
Standard demographic adjustment	4	222.5	234.3	222.8	219.0
State assessment adjustment		222.5	233.8	222.9	218.8
		(n=260)	(n=229)	(n=661)	(n=159)
No adjustment		263.8	264.0	256.2	261.7
Standard demographic adjustment	8	263.4	263.4	255.6	261.5
State assessment adjustment		262.5	264.4	255.9	260.9

Source: National Assessment of Educational Progress: 2003. State assessment scores were provided by state education agencies for this study.

Table 7: Comparison of NAEP reading means with demographic and state assessment adjustments, for Black, White, and Hispanic students: 2003

Demographic group / type of adjustment	Grade	State 1	State 2	State 3	State 4
White		(n=2,699)	(n=2,692)	(n=2,653)	(n=2,241)
No adjustment		226.3	231.3	234.1	225.8
Standard demographic adjustment	4	226.3	231.2	233.8	225.8
State assessment adjustment		226.3	231.1	233.7	225.6
		(n=2,102)	(n=2,385)	(n=2,447)	(n=1,678)
No adjustment		267.5	270.8	278.2	268.6
Standard demographic adjustment	8	267.3	270.7	278.1	268.4
State assessment adjustment		267.1	270.6	277.7	268.2
Black		(n=240)	(n=1,685)	(n=988)	(n=2,916)
No adjustment		211.9	202.8	207.0	199.1
Standard demographic adjustment	4	212.0	202.6	206.9	198.9
State assessment adjustment		212.4	203.0	206.9	199.1
		(n=151)	(n=1,552)	(n=801)	(n=2,576)
No adjustment		250.4	247.5	254.5	244.0
Standard demographic adjustment	8	250.0	247.3	254.1	243.6
State assessment adjustment		250.5	246.9	253.8	243.6
Hispanic		(n=445)	(n=344)	(n=759)	(n=299)
No adjustment		200.2	210.4	203.6	199.4
Standard demographic adjustment	4	200.2	210.4	203.2	199.3
State assessment adjustment		201.1	209.8	204.0	199.3
		(n=270)	(n=209)	(n=599)	(n=162)
No adjustment		245.7	242.6	247.0	242.8
Standard demographic adjustment	8	245.4	242.7	246.8	242.5
State assessment adjustment		244.9	243.0	245.6	243.2

Source: National Assessment of Educational Progress: 2003. State assessment scores were provided by state education agencies for this study.

The results for each of the three subgroups are similar to each other and to the overall results: the adjustment for absence in the grade 4 NAEP scores was about 0.1 NAEP points, and the adjustment for absence in the grade 8 NAEP scores was about 0.4 NAEP points. Although there were variations between states, they were smaller than the standard errors of NAEP means.

Type of absence. Although, overall, students who are absent from the NAEP session tend to perform about the same as other students on their state assessments, that may not be true for students with different types of absences. It is difficult to address this question because of the small numbers of students in each recorded category of absences (other than "temporary" absences). However, we can group all of the absences other than temporary or parental refusals into a single category of students whose absence may be indicative of poor academic achievement. These include suspensions, chronic absences, and student refusals, among others. The results of the comparison of adjustments for types of absences are displayed in tables 8 and 9.

Table 8 Comparison of NAEP mathematics means with state assessment adjustments, for temporary, parent refusal, and other absences: 2003

Type of absence	Grade	State 1 Mean	State 2 Mean	State 3 Mean	State 4 Mean
Temporary	4	(n=139)	(n=226)	(n=204)	(n=217)
State assessment adjustment		237.0	240.3	243.7	227.9
	8	(n=138)	(n=233)	(n=221)	(n=226)
State assessment adjustment		273.3	273.8	284.2	265.7
Parent Refusal	4	(n=13)	(n=19)	(n=39)	(n=29)
State assessment adjustment		249.0	235.7	232.3	241.4
	8	(n=38)	(n=48)	(n=63)	(n=34)
State assessment adjustment		284.3	284.0	285.2	270.5
Other Absence	4	(n=8)	(n=9)	(n=23)	(n=18)
State assessment adjustment		228.7	227.7	227.8	216.4
	8	(n=52)	(n=34)	(n=83)	(n=75)
State assessment adjustment		274.7	261.0	269.5	248.6
Not Absent	4	(n=3,769)	(n=4,912)	(n=4,499)	(n=5,372)
No adjustment		238.1	242.1	241.8	230.3
Standard demographic adjustment		238.1	242.1	241.8	230.3
State assessment adjustment		238.1	242.1	241.8	230.3
	8	(n=2,629)	(n=4,093)	(n=3,773)	(n=4,246)
No adjustment		281.6	281.6	287.1	269.9
Standard demographic adjustment		281.2	281.2	286.7	269.6
State assessment adjustment		281.6	281.6	287.1	269.9

Source: National Assessment of Educational Progress: 2003. State assessment scores were provided by state education agencies for this study.

Table 9: Comparison of NAEP reading means with state assessment adjustments, for temporary, parent refusal, and other absences: 2003

Type of absence	Grade	State 1 Mean	State 2 Mean	State 3 Mean	State 4 Mean
Temporary	4	(n=146)	(n=204)	(n=212)	(n=208)
State assessment adjustment		224.0	218.3	226.2	213.4
	8	(n=142)	(n=227)	(n=229)	(n=214)
State assessment adjustment		262.1	254.9	266.6	251.7
Parent Refusal	4	(n=24)	(n=14)	(n=44)	(n=32)
State assessment adjustment		228.6	228.0	215.4	223.1
	8	(n=22)	(n=45)	(n=41)	(n=34)
State assessment adjustment		263.3	264.0	272.7	263.5
Other Absence	4	(n=6)	(n=8)	(n=26)	(n=29)
State assessment adjustment		208.1	227.1	227.2	181.4
	8	(n=61)	(n=38)	(n=80)	(n=68)
State assessment adjustment		250.0	247.6	256.1	246.2
Not Absent	4	(n=3,635)	(n=4,810)	(n=4,396)	(n=5,354)
No adjustment		221.1	221.0	227.6	213.7
Standard demographic adjustment		221.1	220.9	227.3	213.7
State assessment adjustment		221.1	221.0	227.6	213.7
	8	(n=2,625)	(n=4,058)	(n=3,770)	(n=4,223)
No adjustment		264.1	261.6	273.5	257.8
Standard demographic adjustment		263.9	261.5	273.3	257.5
State assessment adjustment		264.1	261.6	273.5	257.8

Source: National Assessment of Educational Progress: 2003. State assessment scores were provided by state education agencies for this study.

It is apparent from the results in tables 8 and 9 that the deficits associated with "other absences" are greater than those associated with temporary absences or parental refusals. The deficits are more pronounced at the eighth grade, where these "other absences" are also more frequent.

At grade 8, the "other absences" make up 20.0 percent of all absences across the 16 state NAEP samples included in this study, compared to 6.7 percent at grade 4. Averaged over both subjects and all four states, the imputed deficits associated with "other absences" are 11.4 NAEP points at grade 4 and 15.4 points at grade 8. These compare to deficits associated with "temporary absences" of 0.6 points at grade 4 and 5.6 points at grade 8.

Adjustment by Weighting. To address whether adjustments based on state assessment outcomes differ substantially depending on whether they are implemented as imputations of scores for absent students or as reassignment of weights to students with scores, state assessment scores were used to establish deciles for reweighting. Table 10 compares the results of two methods for using state assessment scores to adjust for NAEP absences. The table reveals only trivial differences between the two methods.

Table 10. NAEP means by adjustment method (No adjustment, weighting based on state assessment outcomes, and imputation based on state assessment outcomes)

	Reading			Math		
	None	Weighting	Imputation	None	Weighting	Imputation
Grade 4						
State 1	221.07	221.13	221.22	238.13	238.13	238.11
State 2	221.01	220.98	220.87	242.13	242.00	241.97
State 3	227.60	227.50	227.41	241.85	241.80	241.76
State 4	213.73	213.72	213.71	230.29	230.28	230.26
Grade 8						
State 1	264.13	263.81	263.73	281.64	281.17	281.14
State 2	261.64	261.32	261.28	281.59	281.21	281.02
State 3	273.48	273.01	272.74	287.08	286.58	286.57
State 4	257.77	257.53	257.43	269.93	269.51	269.49

Source: National Assessment of Educational Progress: 2003. State assessment scores were provided by state education agencies for this study.

Finally, although the nonparticipation adjustments in the study were very small, that should not be taken as evidence that there is no difference between demographics and state assessment scores in predicting NAEP achievement. As shown in table 11, state assessment scores are substantially better predictors of NAEP achievement than demographic information. This should be considered in planning for nonparticipation adjustments in cases where absence may be a greater problem (e.g., at grade 12).

Table 11. R^2 values indicating the strength of the relationship between NAEP means and state assessment outcomes, and between NAEP means and demographic predictors

	Reading		Math	
	State assessment	Demographics	State assessment	Demographics
Grade 4				
State 1	.43	.25	.51	.22
State 2	.55	.27	.66	.25
State 3	.47	.32	.58	.28
State 4	.48	.28	.57	.28
Grade 8				
State 1	.46	.30	.62	.25
State 2	.50	.25	.68	.24
State 3	.51	.32	.67	.32
State 4	.48	.36	.59	.34

Source: National Assessment of Educational Progress: 2003. State assessment scores were provided by state education agencies for this study.

4. *Is the use of state assessment data for this purpose feasible?*

In order to obtain the four states required for this study, six states were approached. Because of the timing of the study, it was necessary to match the students and acquire their state assessment scores after the main work of compiling NAEP sample lists had been completed. As an inducement to participate, the states were offered access to the information on the correlation between their state test and NAEP that would be generated by the study. Four of the initial six states agreed to participate, one declined without providing a reason, and one declined because the state was in the process of changing assessments and they were not interested in obtaining correlational data for their outgoing assessment.

All of the participating states maintained a statewide database of state assessment scores. In order to tap this information for the study, it was necessary to obtain the state identification number for each student in the NAEP sample. Since, as noted, this was being done after the fact, the matching had to be done on the basis of information available on existing NAEP rosters—namely school name, student name, and certain student characteristics, such as race/ethnicity, sex, birth year, and birth month, that are collected for use in NAEP analyses.[1] In most cases, this allowed a unique match, but there were identification problems in some schools where more than one student had the same name. Once the state identification numbers had been obtained, it was relatively simple for an analyst in the state department of education to run the list against their state database and provide the state assessment scores. The only complexity was the need to protect the confidentiality of both the NAEP identifiers and the state assessment identifiers so that unauthorized individuals would not have access to either NAEP scores or state assessment scores for individual, identifiable students. However, this is not inherently different from protecting the confidentiality of other types of student data that are collected for use in NAEP analysis, such as the students' Free or Reduced Price Lunch eligibility, or their designation as English language learners or students with disabilities.

Standard NAEP procedures entail compiling rosters of sampled students in advance of the actual assessment that contain all of the school-records data (e.g., race/ethnicity, birth month and year) that will subsequently be used in analyses. With the increasing availability of electronic databases at the state and district level, these rosters are more often compiled centrally, facilitated by these databases. If state assessment scores were to be incorporated into NAEP procedures, this is the point at which they would be added, thus eliminating the need for after-the-fact hand matching.

Other factors that enter into considerations of feasibility are whether the state conducts assessments at the proper grade levels, whether the state assessment data are processed and available in time to be of use to NAEP, and the complexities of acquiring state assessment scores in states that do not maintain unique state-level student identifiers or electronic databases of student assessment scores. With regard to grade-level testing, this could have been a problem in the past, but is no longer a problem (except at grade 12) due to the state testing requirements of No Child Left Behind. With regard to timeliness, this study has shown that it is feasible to use state test data from the preceding year, which means that the data would almost certainly be available by the time NAEP sample rosters are prepared in early winter. Finally, with regard to the problems of collecting these data in the absence of a centralized database, it would still be possible to compile the data at the school level, but the level of effort could be substantially greater, particularly if the data had to be hand-entered. Fortunately, states are increasingly moving towards the use of centralized databases.

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[1] Although NAEP analysis files are purged of individual identifying data, rosters of sampled students that include student names are maintained within the state for a certain period of time to allow the actual test administration. The individual who serves as the full-time NAEP coordinator has access to this information, and this was the individual within each state who carried out the matching for the study.

Conclusions

About 5 percent of NAEP fourth graders and 7.5 percent of NAEP eighth graders are absent from NAEP for one reason or another and do not participate in a make-up session. This study of NAEP adjustments for student nonparticipation (absences) made use of matched state assessment scores in four states. In these states, a search was made for state assessment scores for all students selected for NAEP, whether or not they actually participated. The overarching research question for the study is whether state assessment scores could enhance the adjustments for NAEP nonparticipation. It should be noted that in carrying out the analyses, we deleted the excluded students with disabilities and English language learners from the analysis files, because excluded students are qualitatively different from absent students and because a valid alternative method for adjusting for student exclusions has already been developed (e.g., McLaughlin, 2003).

The major findings of the study, based on four states, are the following.

1. More than three-quarters of the students absent from NAEP have state assessment scores.

2. In states with tests in both grades 3 and 4 or both grades 7 and 8, the percentage of NAEP absent students for which the previous grade's state assessment scores are available is nearly as high as the percentage of absent students for which the same grade's state assessment scores are available.

3. The state assessment scores are strongly correlated with NAEP achievement.

4. The correlations of NAEP with the previous grade's state assessment scores are essentially the same as the correlations with the same grade's state assessment scores.

5. Overall, the adjustments for absences, whether by the standard NAEP method of demographic reweighting or by imputation based on state assessment scores, are very small, generally less than one NAEP point. That is, the evidence indicates that, overall, NAEP absent students are not very different from NAEP present students in terms of demographics or state assessment scores.

6. In the overall average, the adjustments were on the order of 0.1 NAEP points for grade 4 and 0.4 NAEP points for grade 8.

7. There were no systematic patterns of difference across states between absent and non-absent White, Black, and Hispanic students in terms of state assessment scores.

8. A category of types of absences likely to be associated with achievement deficits (e.g., chronic absences or suspensions) is associated with lower scores. Based on differences in state assessment scores, these students would score 11 points lower (than "non-absent" students) on NAEP in grade 4 and 15 points lower in grade 8. At grade 4, these categories comprised only 7 percent of the absences, but at grade 8, they comprised 20 percent of the absences.

9. As a check on a method effect, adjustments using state assessment scores were done using both imputation and reweighting. The results were virtually identical.

10. In spite of the finding of little difference in adjustments for absences based on state assessment scores or on demographic factors in the 2003 NAEP grade 4 and 8 reading and mathematics assessments in four states, the fact remains that should these adjustments become important, the state assessment scores are substantially more highly predictive of NAEP achievement than are demographic measures.

11. Adding state assessment scores to NAEP files is feasible and relatively straightforward, particularly if states maintain centralized electronic data files of state assessment score data and if the scores are added at the same time as other school-records-based data used by NAEP.

In summary, this study revealed two important facts: (1) state assessment data are readily available and sufficiently correlated with NAEP results to support use of those data for imputation of missing NAEP scores; and (2) for the most part, student absence was not a significant problem for the 2003 NAEP grade 4 and grade 8 reading and mathematics assessments.

Finally, this study focuses on a federally mandated assessment in grades 4 and 8; the problem of absences may be more severe in other testing situations. For example, the results might have been much more striking if the assessment had been at grade 12. Comparison between grades 4 and 8 can provide some insight into that question, if we assume that the differences would be in the same direction but greater in comparing grades 4 and 12. The main pattern is that absence is a greater problem in the higher grade, where greater numbers and a greater percentage of the absences are of types indicative of lower achievement. At grade 8, the 20 percent of absences of that type had state assessment scores nearly one-half standard deviation (15 points on the NAEP scale) lower than students who were not absent. Thus, the small adjustment effects found in this study should not be generalized to create expectations of similarly small effects for grade 12.

References

McLaughlin, D. (2003). *Full-Population Estimates of Reading Achievement Gains between 1998 and 2002.* Report to NCES supporting inclusion of full population estimates in the report of the 2002 NAEP reading assessment. Palo Alto, CA: American Institutes for Research.

McLaughlin, D., Gallagher, L., and Stancavage, F. (2004). *Evaluation of Bias Correction Methods for "Worst-case" Selective Non-participation in NAEP: A publication of the NAEP Validity Studies Panel*, Palo Alto, CA: American Institutes for Research.

Appendix: Tables of Nonresponse adjustments in four states.

The appendix tables display a variety of statistics. The three key statistics (unadjusted mean, mean with standard demographic correction, and mean with imputation from state assessment results), which are reproduced in tables 4 and 5 in the body of this report, are indicated in boldface in each appendix table.

Table A-1. Standard NAEP Non-Response Adjusted Means and Means Using Grade 3 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Mathematics Assessment: State 1

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	NAEP scores SD	State scores Mean	State scores SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	3,929	72,014.9	100.0	**238.1**	27.4	191.3	18.0	*238.2*
Students with NAEP & state scores	2,789	50,102.3	69.6	240.8	26.3	191.3	18.1	
Students having only NAEP score	980	19,028.9	26.4	231.2	29.1	—	—	
Students having only state score	113	2,021.5	2.8	—	—	191.1	16.4	*240.5*
Students having neither score	47	862.3	1.2	—	—	—	—	*234.2*
Standard non-response adjusted weights								
Overall totals	3,929	72,277.8	100.0	**238.1**	27.5			
Students with NAEP & state scores	2,789	52,384.6	72.5	240.7	26.3			
Students having only NAEP score	980	19,893.2	27.5	231.2	29.1			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-2. Standard NAEP Non-Response Adjusted Means and Means Using Grade 4 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Mathematics Assessment: State 1

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	NAEP scores SD	State scores Mean	State scores SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	3,929	72,014.9	100.0	**238.1**	27.4	403.1	32.3	*238.1*
Students with NAEP & state scores	3,093	56,743.8	78.8	240.0	26.6	403.1	32.3	
Students having only NAEP score	676	12,387.4	17.2	229.8	29.5	—	—	
Students having only state score	124	2,215.8	3.1	—	—	401.8	31.5	*238.8*
Students having neither score	36	668.0	0.9	—	—	—	—	*233.2*
Standard non-response adjusted weights								
Overall totals	3,929	72,277.8	100.0	**238.1**	27.5			
Students with NAEP & state scores	3,093	59,353.1	82.1	239.9	26.6			
Students having only NAEP score	676	12,924.7	17.9	229.8	29.5			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-3. Standard NAEP Non-Response Adjusted Means and Means Using Grade 3 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Mathematics Assessment: State 2

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	5,166	94,954.9	100.0	**242.1**	26.6	252.7	7.4	***242.0***
Students with NAEP & state scores	3,842	69,572.6	73.3	244.8	25.8	252.8	7.4	
Students having only NAEP score	1,070	20,635.4	21.7	233.0	27.3	—	—	
Students having only state score	183	3,349.8	3.5	—	—	251.7	7.8	*241.0*
Students having neither score	71	1,397.1	1.5	—	—	—	—	*234.0*
Standard non-response adjusted weights								
Overall totals	5,166	94,603.8	100.0	**242.1**	26.7			
Students with NAEP & state scores	3,842	72,855.9	77.0	244.8	25.9			
Students having only NAEP score	1,070	21,747.9	23.0	232.9	27.3			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-4. Standard NAEP Non-Response Adjusted Means and Means Using Grade 4 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Mathematics Assessment: State 2

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	5,166	94,954.9	100.0	**242.1**	26.6	260.1	7.2	***242.0***
Students with NAEP & state scores	4,018	72,321.5	76.2	244.6	26.0	260.1	7.2	
Students having only NAEP score	894	17,886.5	18.8	231.9	26.6	—	—	
Students having only state score	199	3,592.0	3.8	—	—	259.3	8.0	*241.6*
Students having neither score	55	1,154.9	1.2	—	—	—	—	*232.7*
Standard non-response adjusted weights								
Overall totals	5,166	94,603.8	100.0	**242.1**	26.7			
Students with NAEP & state scores	4,018	75,741.1	80.1	244.6	26.1			
Students having only NAEP score	894	18,862.7	19.9	231.8	26.6			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-5. Standard NAEP Non-Response Adjusted Means and Means Using Grade 4 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Mathematics Assessment: State 3

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	4,765	70,254.5	100.0	**241.8**	27.0	236.6	15.6	***241.8***
Students with NAEP & state scores	4,151	62,697.7	89.2	243.0	26.6	236.7	15.6	
Students having only NAEP score	348	3,507.0	5.0	221.5	26.5	—	—	
Students having only state score	240	3,759.2	5.4	—	—	235.8	15.6	*241.4*
Students having neither score	26	290.6	0.4	—	—	—	—	*226.5*
Standard non-response adjusted weights								
Overall totals	4,765	70,447.5	100.0	**241.8**	27.0			
Students with NAEP & state scores	4,151	66,654.3	94.6	242.9	26.6			
Students having only NAEP score	348	3,793.3	5.4	221.8	26.4			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-6. Standard NAEP Non-Response Adjusted Means and Means Using Grade 4 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Mathematics Assessment: State 4

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	5,636	112,394.5	100.0	**230.3**	29.2	328.7	29.9	***230.3***
Students with NAEP & state scores	4,500	90,068.9	80.1	231.5	28.9	328.8	30.0	
Students having only NAEP score	872	16,888.7	15.0	223.9	29.8	—	—	
Students having only state score	216	4,548.7	4.0	—	—	327.8	29.1	*230.6*
Students having neither score	48	888.1	0.8	—	—	—	—	*225.1*
Standard non-response adjusted weights								
Overall totals	5,636	112,094.0	100.0	**230.3**	29.3			
Students with NAEP & state scores	4,500	94,350.5	84.2	231.5	29.0			
Students having only NAEP score	872	17,743.5	15.8	223.8	29.9			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-7. Standard NAEP Non-Response Adjusted Means and Means Using Grade 7 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 8 Mathematics Assessment: State 1

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	2,857	73,558.4	100	**281.6**	35.8	377.6	48.4	***281.1***
Students with NAEP & state scores	2,076	53,034.4	72.1	283.8	35.0	378.2	48.1	
Students having only NAEP score	553	14,574.1	19.8	273.9	37.6	—	—	
Students having only state score	140	3,609.2	4.9	—	—	368.0	51.9	*276.3*
Students having neither score	88	2,340.8	3.2	—	—	—	—	*274.2*
Standard non-response adjusted weights								
Overall totals	2,857	73,516.4	100	**281.2**	36.0			
Students with NAEP & state scores	2,076	57,631.3	78.4	283.4	35.1			
Students having only NAEP score	553	15,885.1	21.6	273.3	37.9			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-8. Standard NAEP Non-Response Adjusted Means and Means Using Grade 7 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 8 Mathematics Assessment: State 2

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	4,408	100,282.1	100.0	**281.6**	36.3	269.2	10.8	***281.0***
Students with NAEP & state scores	3,535	80,518.3	80.3	285.9	34.2	269.4	10.7	
Students having only NAEP score	558	12,768.9	12.7	254.5	37.2	—	—	
Students having only state score	244	5,521.4	5.5	—	—	265.9	11.4	*274.5*
Students having neither score	71	1,473.5	1.5	—	—	—	—	*269.4*
Standard non-response adjusted weights								
Overall totals	4,408	100,309.9	100.0	**281.2**	36.4			
Students with NAEP & state scores	3,535	86,366.8	86.1	285.6	34.3			
Students having only NAEP score	558	13,943.1	13.9	254.0	37.2			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-9. Standard NAEP Non-Response Adjusted Means and Means Using Grade 8 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 8 Mathematics Assessment: State 2

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	4,408	100,282.1	100.0	**281.6**	36.3	273.0	10.2	*281.1*
Students with NAEP & state scores	3,686	83,410.0	83.2	285.3	34.7	273.2	10.2	
Students having only NAEP score	407	9,877.1	9.8	250.6	34.9	—	—	
Students having only state score	256	5,771.1	5.8	—	—	270.3	10.8	*275.3*
Students having neither score	59	1,223.9	1.2	—	—	—	—	*267.2*
Standard non-response adjusted weights								
Overall totals	4,408	100,309.9	100.0	**281.2**	36.4			
Students with NAEP & state scores	3,686	89,479.3	89.2	285.0	34.7			
Students having only NAEP score	407	10,830.6	10.8	250.1	34.9			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-10. Standard NAEP Non-Response Adjusted Means and Means Using Grade 8 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 8 Mathematics Assessment: State 3

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	4,140	72,254.2	100	**287.1**	34.8	234.9	17.9	*286.6*
Students with NAEP & state scores	3,601	63,144.4	87.4	287.6	34.4	235.1	17.9	
Students having only NAEP score	172	2,398.4	3.3	272.6	40.8	—	—	
Students having only state score	321	5,947.9	8.2	—	—	232.7	18.0	*283.1*
Students having neither score	46	763.5	1.1	—	—	—	—	*270.4*
Standard non-response adjusted weights								
Overall totals	4,140	72,281.7	100	**286.7**	34.9			
Students with NAEP & state scores	3,601	69,612.6	96.3	287.3	34.6			
Students having only NAEP score	172	2,669.1	3.7	272.1	40.9			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-11. Standard NAEP Non-Response Adjusted Means and Means Using Grade 8 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 8 Mathematics Assessment: State 4

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	4,581	107,795.1	100.0	**269.9**	37.2	319.0	29.1	***269.5***
Students with NAEP & state scores	3,395	78,960.6	73.3	269.7	36.9	319.3	29.2	
Students having only NAEP score	851	21,466.5	19.9	270.8	38.0	—	—	
Students having only state score	243	5,163.9	4.8	—	—	315.5	27.5	*265.0*
Students having neither score	92	2,204.2	2.0	—	—	—	—	*260.0*
Standard non-response adjusted weights								
Overall totals	4,581	107,944.8	100.0	**269.6**	37.3			
Students with NAEP & state scores	3,395	84,758.0	78.5	269.3	37.1			
Students having only NAEP score	851	23,186.8	21.5	270.4	38.2			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-12. Standard NAEP Non-Response Adjusted Means and Means Using Grade 3 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Reading Assessment: State 1

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	3,811	69,884.4	100.0	**221.1**	35.0	188.5	19.0	***221.2***
Students with NAEP & state scores	2,759	49,727.7	71.2	223.3	34.4	188.4	19.0	
Students having only NAEP score	876	16,826.7	24.1	214.5	35.9	—	—	
Students having only state score	132	2,413.0	3.5	—	—	189.3	19.5	*224.9*
Students having neither score	44	917.0	1.3	—	—	—	—	*218.6*
Standard non-response adjusted weights								
Overall totals	3,811	69,620.2	100.0	**221.1**	35.0			
Students with NAEP & state scores	2,759	52,020.1	74.7	223.3	34.4			
Students having only NAEP score	876	17,600.0	25.3	214.5	35.9			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-13. Standard NAEP Non-Response Adjusted Means and Means Using Grade 4 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Reading Assessment: State 1

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	3,811	69,884.4	100.0	**221.1**	35.0	407.0	19.3	*221.2*
Students with NAEP & state scores	3,048	55,860.9	79.9	222.3	34.5	406.9	19.3	
Students having only NAEP score	587	10,693.5	15.3	214.6	36.7	—	—	
Students having only state score	136	2543.0	3.6	—	—	409.3	19.0	*226.6*
Students having neither score	40	787.0	1.1	—	—	—	—	*216.6*
Standard non-response adjusted weights								
Overall totals	3,811	69,620.2	100.0	**221.1**	35.0			
Students with NAEP & state scores	3,048	58,449.7	84.0	222.3	34.5			
Students having only NAEP score	587	11,170.4	16.0	214.6	36.7			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-14. Standard NAEP Non-Response Adjusted Means and Means Using Grade 3 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Reading Assessment: State 2

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	5,036	93,803.2	100.0	**221.0**	35.2	149.2	8.5	*220.9*
Students with NAEP & state scores	3,981	72,861.1	77.7	222.9	34.6	149.2	8.5	
Students having only NAEP score	829	16,963.9	18.1	212.8	36.5	—	—	
Students having only state score	168	2,970.8	3.2	—	—	148.5	8.4	*220.2*
Students having neither score	58	1,007.4	1.1	—	—	—	—	*210.6*
Standard non-response adjusted weights								
Overall totals	5,036	94,155.0	100.0	**220.9**	35.3			
Students with NAEP & state scores	3,981	76,282.6	81.0	222.8	34.7			
Students having only NAEP score	829	17,872.4	19.0	212.6	36.6			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-15. Standard NAEP Non-Response Adjusted Means and Means Using Grade 4 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Reading Assessment: State 2

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	5,036	93,803.2	100.0	**221.0**	35.2	253.4	8.6	***220.9***
Students with NAEP & state scores	4,246	76,882.5	82.0	222.3	35.3	253.4	8.6	
Students having only NAEP score	564	12,942.5	13.8	213.6	34.0	—	—	
Students having only state score	184	3,132.4	3.3	—	—	253.3	8.7	*221.9*
Students having neither score	42	845.8	0.9	—	—	—	—	*210.3*
Standard non-response adjusted weights								
Overall totals	5,036	94,155.0	100.0	**220.9**	35.3			
Students with NAEP & state scores	4,246	80,491.8	85.5	222.2	35.3			
Students having only NAEP score	564	13,663.2	14.5	213.4	34.1			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-16. Standard NAEP Non-Response Adjusted Means and Means Using Grade 3 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Reading Assessment: State 3

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	4,678	69,212.8	100.0	**227.6**	33.2	30.6	6.9	***227.4***
Students with NAEP & state scores	3,991	59,787.9	86.4	228.5	32.9	30.7	6.8	
Students having only NAEP score	405	5,021.0	7.3	217.0	34.3	—	—	
Students having only state score	242	3,894.9	5.6	—	—	30.2	6.5	*226.2*
Students having neither score	40	509.0	0.7	—	—	—	—	*210.7*
Standard non-response adjusted weights								
Overall totals	4,678	69,019.5	100.0	**227.3**	33.3			
Students with NAEP & state scores	3,991	63,625.8	92.2	228.2	33.0			
Students having only NAEP score	405	5,393.7	7.8	216.6	34.5			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-17. Standard NAEP Non-Response Adjusted Means and Means Using Grade 4 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Reading Assessment: State 3

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	4,678	69,212.8	100.0	**227.6**	33.2	240.3	14.2	*227.4*
Students with NAEP & state scores	4,192	62,412.2	90.2	228.1	33.0	240.4	14.3	
Students having only NAEP score	204	2,396.8	3.5	214.7	33.7	—	—	
Students having only state score	254	4,158.3	6.0	—	—	239.2	13.5	*225.3*
Students having neither score	28	245.5	0.4	—	—	—	—	*214.3*
Standard non-response adjusted weights								
Overall totals	4,678	69,019.5	100.0	**227.3**	33.3			
Students with NAEP & state scores	4,192	66,457.7	96.3	227.8	33.1			
Students having only NAEP score	204	2,561.8	3.7	214.6	33.9			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-18. Standard NAEP Non-Response Adjusted Means and Means Using Grade 4 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 4 Reading Assessment: State 4

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	5,623	111,984.8	100.0	**213.7**	37.7	339.7	36.9	*213.7*
Students with NAEP & state scores	4,616	93,839.1	83.8	214.9	37.4	339.7	36.7	
Students having only NAEP score	737	13,098.4	11.7	205.1	38.4	—	—	
Students having only state score	212	4,190.3	3.7	—	—	340.0	40.7	*215.2*
Students having neither score	58	856.9	0.8	—	—	—	—	*204.4*
Standard non-response adjusted weights								
Overall totals	5,623	112,284.3	100.0	**213.7**	37.8			
Students with NAEP & state scores	4,616	98,529.4	87.8	214.9	37.5			
Students having only NAEP score	737	13,754.9	12.3	204.9	38.6			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-19. Standard NAEP Non-Response Adjusted Means and Means Using Grade 7 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 8 Reading Assessment: State 1

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	2,850	72,925.9	100.0	**264.1**	34.3	396.2	18.6	*263.7*
Students with NAEP & state scores	2,075	52,723.3	72.3	265.2	33.7	396.4	18.5	
Students having only NAEP score	550	14,459.2	19.8	260.3	36.1	—	—	
Students having only state score	149	3,813.6	5.2	—	—	394.2	19.6	*261.2*
Students having neither score	76	1,929.9	2.6	—	—	—	—	*254.6*
Standard non-response adjusted weights								
Overall totals	2,850	72,966.6	100.0	**263.9**	34.3			
Students with NAEP & state scores	2,075	57,254.5	78.5	264.9	33.8			
Students having only NAEP score	550	15,712.1	21.5	260.0	36.1			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-20. Standard NAEP Non-Response Adjusted Means and Means Using Grade 7 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 8 Reading Assessment: State 2

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	4,368	98,307.6	100.0	**261.6**	32.9	160.8	7.8	*261.3*
Students with NAEP & state scores	3,624	82,648.5	84.1	263.3	32.0	160.9	7.7	
Students having only NAEP score	433	8,789.0	8.9	245.8	37.1	—	—	
Students having only state score	239	5,203.2	5.3	—	—	159.5	8.6	*257.5*
Students having neither score	72	1,666.9	1.7	—	—	—	—	*253.4*
Standard non-response adjusted weights								
Overall totals	4,368	98,278.9	100.0	**261.5**	33.0			
Students with NAEP & state scores	3,624	88,776.0	90.3	263.2	32.0			
Students having only NAEP score	433	9,502.9	9.7	245.5	37.3			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-21. Standard NAEP Non-Response Adjusted Means and Means Using Grade 8 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 8 Reading Assessment: State 2

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	4,368	98,307.6	100.0	**261.6**	32.9	264.7	8.4	***261.2***
Students with NAEP & state scores	3,816	86,198.2	87.7	262.6	32.6	264.8	8.3	
Students having only NAEP score	241	5,239.3	5.3	246.0	33.8	—	—	
Students having only state score	255	5,507.8	5.6	—	—	263.1	9.4	*255.9*
Students having neither score	56	1,362.2	1.4	—	—	—	—	*252.4*
Standard non-response adjusted weights								
Overall totals	4,368	98,278.9	100.0	**261.5**	33.0			
Students with NAEP & state scores	3,816	92,631.3	94.3	262.4	32.7			
Students having only NAEP score	241	5,647.7	5.7	245.8	34.0			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-22. Standard NAEP Non-Response Adjusted Means and Means Using Grade 7 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 8 Reading Assessment: State 3

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	4,120	71,191.3	100.0	**273.5**	34.2	243.7	13.0	***272.7***
Students with NAEP & state scores	3,466	60,263.8	84.7	274.4	33.8	244.0	12.9	
Students having only NAEP score	304	4,469.0	6.3	260.7	36.4	—	—	
Students having only state score	284	5,526.1	7.8	—	—	240.4	13.7	*265.2*
Students having neither score	66	932.4	1.3	—	—	—	—	*265.9*
Standard non-response adjusted weights								
Overall totals	4,120	71,164.7	100.0	**273.3**	34.3			
Students with NAEP & state scores	3,466	66,196.0	93.0	274.2	33.9			
Students having only NAEP score	304	4,968.7	7.0	260.5	36.3			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.

Table A-23. Standard NAEP Non-Response Adjusted Means and Means Using Grade 8 State Assessment Scores for Non-Response Adjustments in the NAEP 2003 Grade 8 Reading Assessment: State 4

Subsample	N	Sum of weights	Pct. of weight	NAEP scores Mean	SD	State scores Mean	SD	Imputed scores Mean
Unadjusted sample weights								
Overall totals	4,539	107,204.9	100.0	**257.8**	34.8	337.3	36.6	*257.4*
Students with NAEP & state scores	3,426	79,613.4	74.3	258.0	34.4	337.6	36.2	
Students having only NAEP score	793	20,410.2	19.0	256.8	36.4	—	—	
Students having only state score	225	5,235.8	4.9	—	—	332.5	41.4	*253.2*
Students having neither score	95	1,945.5	1.8	—	—	—	—	*250.9*
Standard non-response adjusted weights								
Overall totals	4,539	107,059.9	100.0	**257.5**	35.0			
Students with NAEP & state scores	3,426	85,185.1	79.6	257.7	34.6			
Students having only NAEP score	793	21,874.8	20.4	256.5	36.6			

Note: — Scores not available. Italics: Entry based on state assessment scores or nonstandard demographic imputation.