

NAEP 2017 NONRESPONSE BIAS ANALYSIS REPORT

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1. NONRESPONSE BIAS ANALYSIS IN THE 2017 NAEP

NCES statistical standards call for a nonresponse bias analysis to be conducted for a sample with a response rate below 85 percent. Weighted school response rates for 2017 NAEP indicate a need for school nonresponse bias analyses for private school samples for grades 4 and 8 (operational assessment subjects). Based on the weighted student response rates for each subject, a student nonresponse bias analysis is necessary for the grade 8 public school student samples for New York state for both mathematics and reading, and for the Washington, DC TUDA district for mathematics.

Response rates for schools and students are shown in tables 1 and 2, respectively, for the cases where nonresponse bias analyses are required.

Table 1. Weighted school response rates, before substitution

Domain		Response Rate
Grade 4	Private	61.1
Grade 8	Private	59.3

Table 2. Weighted student response rates

Domain (public)		Response Rate by Subject	
		Mathematics	Reading
Grade 8	New York	83.3	84.5
	Washington, DC TUDA	84.6	86.4 ¹

The analyses conducted in this report consider only certain characteristics of schools and students. They do not directly consider the effects of the nonresponse on student achievement; the primary focus of NAEP. Thus, these analyses cannot be conclusive of either the existence or absence of nonresponse bias for student achievement (see Peytcheva and Groves, 2009).

¹ Since the response rate for reading in Washington, DC was above 85 percent, no nonresponse bias analysis is required.

2. SCHOOL NONRESPONSE BIAS ANALYSIS

The school analysis, required for private school samples in grades 4 and 8 (operational subjects), was conducted in three parts.

1. The distribution of the responding original school sample was compared with that of the entire eligible original school sample. Schools were weighted by their school base weights and their enrollment, referred to as a size-adjusted weight. The original sample is the sample before substitution.
2. The distribution of the responding sample, including participating substitutes was compared to the full sample (but in this case, substitutes were included in place of those nonrespondents that they replaced). Again, the size-adjusted school base weights were used for both the full sample and the respondents.
3. The same sets of schools were compared as in the second analysis, but this time when analyzing the responding schools alone, school nonresponse adjustments were applied to the size-adjusted weights.

The first part of the analysis indicates the potential for nonresponse bias that was introduced through school nonresponse. The second part of the analysis suggests the remaining potential for nonresponse bias after the mitigating effects of substitution have been accounted for. The third part indicates the potential for bias after accounting for the mitigating effects of both substitution and nonresponse weight adjustments. Both the second and third parts, however, may provide an overly optimistic scenario, since even though substitution and nonresponse adjustments may correct somewhat for deficiencies in the few characteristics examined here, there is no guarantee that they are equally as effective for other characteristics, and in particular for student achievement.

In each analysis, chi-square tests of association were conducted between school response status and each of the following four categorical variables:

- Census region;
- Reporting subgroup for private schools, Catholic/non-Catholic;
- Urban-centric locale; and
- Grade enrollment (as shown on school samples frame) divided into three equally sized categories.

The chi-square tests were carried out using procedures that appropriately account for the complex sample design used in NAEP, and the weighting procedures. The Rao-Scott chi-square test (Rao

and Scott, 1984) was computed using the SAS/STAT® 14.1 survey procedures software (SAS Institute Inc., 2015).

In addition, mean values of race/ethnicity percentages and grade enrollment for responding and nonresponding schools were compared. Two measures of the mean size of enrollment in the respective grades were considered, one using the size-adjusted school weight (mean size of school attended by an average student), and the other using the school weight without the size adjustment (mean estimated grade enrollment). Differences between the means for the respondents and full sample were tested using t-tests. These tests also took account of the complex sample design, as well as the fact that the respondents are a subset of the full sample (thus in that sense the first two sets of comparisons, using school base weights, are equivalent to testing whether the mean for respondents is significantly different from the mean for nonrespondents).

The results of these analyses for grades 4 and 8 private schools, are presented in the tables in appendix A, and summarized in tables 3 and 4, respectively.

Table 3. Characteristics with p-values less than 0.05, grade 4 private schools

Analysis	Characteristics with p-values less than 0.05
Original sample	Census region, Reporting Subgroup, Locale, Enrollment Size Class, Grade enrollment, Percent White, Percent Black, Percent Hispanic
Sample with substitutes	Census region, Reporting Subgroup, Locale, Enrollment Size Class, Grade enrollment, Percent White, Percent Black, Percent Hispanic
Nonresponse adjusted	Locale, Percent White, Percent Black

Table 4. Characteristics with p-values less than 0.05, grade 8 private schools

Analysis	Characteristics with p-values less than 0.05
Original sample	Reporting Subgroup, Locale, Enrollment Size Class, Grade enrollment, Percent White, Percent Hispanic
Sample with substitutes	Census region, Reporting Subgroup, Locale, Enrollment Size Class, Grade enrollment, Percent White, Percent Hispanic
Nonresponse adjusted	Size of school attended by average student

In general, nonresponse adjustments decreased the number of variables with significant differences. For grades 4 and 8 private, substitution does not seem to have much effect in reducing the nonresponse bias. However, the nonresponse adjustments appear to have been very effective in reducing the nonresponse bias, as the important variable “private school reporting group” in each sample changed to being non-significant after nonresponse adjustments. However, the biases of some other variables were still significant, or newly significant, after nonresponse adjustments.

For grade 4 private, the results for the urban-centric locale, percent white, and percent black variables remained significant after substitution and nonresponse adjustments. The absolute bias for urban-centric locale decreased for city (4.4 to 1.0 percent), suburban (1.2 to 0.7 percent), town (2.5 to 1.8 percent), and rural (5.7 to 1.4 percent). The absolute bias for percent white decreased from 5.1 to 3.5 percent. The only increased absolute bias after the nonresponse adjustment is the percent black, which increased from 1.9 to 2.4 percent.

For grade 8 private, after nonresponse adjustments, the results for Reporting Subgroup, Locale, Enrollment size class, Grade enrollment, Percent White, Percent Hispanic, that had significant bias in the original sample, all became non-significant. However, the results for mean size of school attended by an average student changed from non-significant to significant after nonresponse adjustments, the absolute bias increasing from 1.9 (non-significant) to 5.6 percent (significant) and the relative bias increasing from 4.4% to 12.7%.

These results suggests there is significant potential for bias to remain in the private school samples, after substitution and nonresponse adjustment. Compared with recent past assessments, the response rates were similar to those of 2015, but 10 to 15 percentage points lower than in earlier years, at each grade. Furthermore, the relatively small sizes of the private school samples in 2017 reduced the effectiveness of the nonresponse adjustments in reducing bias. Once the adjustments had removed the substantial bias in representation by Catholic schools (for example, at grade 4; 19.6 percentage points in the original sample, 14.9 percentage points after substitution, no bias after nonresponse adjustments), the ability to fully adjust for other school characteristics was very limited.

3. STUDENT NONRESPONSE BIAS ANALYSIS

The analysis of student nonresponse bias was required for the grade 8 public school sample in New York state, for mathematics and reading, and the Washington, DC TUDA district for mathematics. This analysis was conducted in two parts for each subject:

1. The distribution of the responding student sample was compared with that of the entire eligible sample of students, using student base weights; and
2. The distribution of the responding student sample was again compared to the entire eligible sample of students. This time, for the responding students, student nonresponse adjustments were applied to the weights.

The first part of the analysis indicates the potential for nonresponse bias that was introduced through student nonresponse. The second part of the analysis indicates the potential for bias after accounting for the effects of nonresponse weight adjustments. The second part, however, may provide an overly optimistic scenario, since even though nonresponse adjustments may correct somewhat for deficiencies in the few characteristics examined here, there is no guarantee that they are equally as effective for other characteristics, and in particular for student achievement.

The following student characteristics were used in the comparisons:

- Sex;
- Race/ethnicity;
- Relative age;
- Free or reduced price lunch eligibility;
- Student Disability (SD) status; and
- English Language Learner (ELL) status.

For these analyses, chi-square tests of the association between student response status and the particular variable under consideration were conducted. These tests were carried out using procedures that appropriately account for the complex sample design used in NAEP, and the weighting procedures.

The results of these analyses are presented in the tables in appendix B, and are summarized in table 5 below.

Table 5. Characteristics with p-values less than 0.05, domains of grade 8 public school students

Domain	Analysis	Characteristics with p-values less than 0.05
New York mathematics	Student base weights	Race, Free lunch, SD
	Nonresponse adjusted student weights	None
New York reading	Student base weights	Race, Free lunch, SD
	Nonresponse adjusted student weights	None
Washington, DC TUDA mathematics	Student base weights	Race, Relative age, Free lunch
	Nonresponse adjusted student weights	SD

The sample sizes are large for student-level files, especially for public schools, which makes the tests very sensitive. In each case, the number of variables with significant differences decreased after nonresponse adjustments. For instance, race, free lunch, and SD status were significant for New York before the nonresponse adjustment, for both subjects. After nonresponse adjustments, none of them remain significant. The nonresponse adjustment helped to reduce the bias for these variables.

An exception occurred for Student Disability (SD) status for the Washington, DC TUDA. This variable became significant after the nonresponse adjustment, although the absolute bias was just 0.8 percentage points. Many student characteristics used in making nonresponse adjustments, and examining nonresponse bias, are strongly correlated. This means that in making adjustments to remove bias with respect to some characteristics it can be introduced for others. This is further compounded by the fact that SD status and ELL status are inter-related characteristics, since some students are both SD and ELL. Thus we observe the pattern of difference for ELL status being reduced (absolute bias decreased from 0.4 to 0.2 percentage points) and slightly increased in SD status (absolute bias increased from 0.4 to 0.8). Overall, the negative impact on the bias for SD status remained relatively small.

In summary, based on the student characteristics available, after nonresponse adjustments have been applied there does not appear to be evidence of substantial potential for nonresponse bias, resulting from student nonresponse in these two jurisdictions.

REFERENCES

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- Rao, J.N.K., and Scott, A.J. (1984). On Chi-Squared Tests for Multiway Contingency Tables with Cell Proportions Estimated from Survey Data. *Annals of Statistics*, **12**, 46-60.
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Appendix A

School Tables

Table A-1. 2017 NAEP grade 4 original sample - weighted percentages of full sample and responding schools by various subgroups - all private schools (sample size = 479)

	Full sample weighted percentage	Respondent weighted percentage	Bias	Relative bias	Chi-square p-value
Census region					<.0001
Northeast	19.03	16.73	-2.3	-0.121	
Midwest	27.27	33.65	6.4	0.234	
South	34.46	29.10	-5.4	-0.156	
West	19.24	20.52	1.3	0.066	
Private school reporting subgroup					<.0001
Roman Catholic	42.43	61.99	19.6	0.461	
Non-Catholic Private	57.57	38.01	-19.6	-0.340	
Urban-centric locale					<.0001
City	41.16	45.54	4.4	0.106	
Suburban	40.99	39.80	-1.2	-0.029	
Town	6.99	9.51	2.5	0.361	
Rural	10.85	5.15	-5.7	-0.526	
Enrollment size class					0.0263
Large (≥ 28)	48.90	50.49	1.6	0.032	
Medium (15-27)	27.55	29.82	2.3	0.082	
Small (≤ 14)	23.55	19.70	-3.9	-0.164	

NOTE: Size-adjusted school weights were used.

Table A-2. 2017 NAEP grade 4 original sample - weighted mean values of various characteristics for full sample and responding schools - all private schools (sample size = 479)

	Full sample mean	Respondent mean	Bias	Relative bias	T-test p-value
Size of school attended by average student	33.58	33.68	0.1	0.003	0.915
Grade enrollment	17.75	20.20	2.4	0.138	0.000
Race/ethnicity					
Percentage White, not Hispanic	69.30	64.23	-5.1	-0.073	0.000
Percentage Black, not Hispanic	9.18	11.06	1.9	0.204	0.003
Percentage Hispanic heritage	11.60	14.50	2.9	0.250	0.000
Percentage Asian	5.27	5.31	0.0	0.008	0.918
Percentage American Indian/Alaskan Native	0.31	0.21	-0.1	-0.326	0.164
Percentage Native Hawaiian/Pacific Islander	0.48	0.61	0.1	0.262	0.056
Percentage Two or more race	3.87	4.10	0.2	0.059	0.412

NOTE: For the mean of school size attended by average student and the race/ethnicity percentages, size-adjusted school weights were used. For the mean of enrollment, school weights were used.

Table A-3. 2017 NAEP grade 4 sample with substitutes - weighted percentages of full sample and responding schools by various subgroups - all private schools (sample size = 479)

	Full sample weighted percentage	Respondent weighted percentage	Bias	Relative bias	Chi-square p-value
Census region					0.0364
Northeast	19.03	17.77	-1.3	-0.066	
Midwest	27.27	30.72	3.4	0.126	
South	34.46	32.02	-2.4	-0.071	
West	19.24	19.49	0.3	0.013	
Private school reporting subgroup					<.0001
Roman Catholic	42.43	57.34	14.9	0.351	
Non-Catholic Private	57.57	42.66	-14.9	-0.259	
Urban-centric locale					<.0001
City	41.16	44.27	3.1	0.075	
Suburban	40.99	40.22	-0.8	-0.019	
Town	6.99	9.12	2.1	0.304	
Rural	10.85	6.39	-4.5	-0.411	
Enrollment size class					0.0024
Large (≥ 28)	48.90	51.30	2.4	0.049	
Medium (15-27)	27.55	29.06	1.5	0.055	
Small (≤ 14)	23.55	19.64	-3.9	-0.166	

NOTE: Size-adjusted school weights were used.

Table A-4. 2017 NAEP grade 4 sample with substitutes - weighted mean values of various characteristics for full sample and responding schools - all private schools (sample size = 479)

	Full sample mean	Respondent mean	Bias	Relative bias	T-test p-value
Size of school attended by average student	33.58	33.65	0.1	0.002	0.909
Grade enrollment	17.75	20.20	2.4	0.138	0.000
Race/ethnicity					
Percentage White, not Hispanic	69.30	64.96	-4.3	-0.063	0.000
Percentage Black, not Hispanic	9.18	10.94	1.8	0.191	0.002
Percentage Hispanic heritage	11.60	13.52	1.9	0.166	0.004
Percentage Asian	5.27	5.65	0.4	0.073	0.451
Percentage American Indian/Alaskan Native	0.31	0.22	-0.1	-0.276	0.256
Percentage Native Hawaiian/Pacific Islander	0.48	0.57	0.1	0.177	0.073
Percentage Two or more race	3.87	4.15	0.3	0.071	0.271

NOTE: For the mean of school size attended by average student and the race/ethnicity percentages, size-adjusted school weights were used. For the mean of enrollment, school weights were used.

Table A-5. 2017 NAEP grade 4 nonresponse-adjusted sample - weighted percentages of full sample and responding schools by various subgroups - all private schools (sample size = 479)

	Full sample weighted percentage	Respondent weighted percentage	Bias	Relative bias	Chi-square p-value
Census region					1.0000
Northeast	19.03	19.03	0.0	0.000	
Midwest	27.27	27.27	0.0	0.000	
South	34.46	34.46	0.0	0.000	
West	19.24	19.24	0.0	0.000	
Private school reporting subgroup					1.0000
Roman Catholic	42.43	42.43	0.0	0.000	
Non-Catholic Private	57.57	57.57	0.0	0.000	
Urban-centric locale					0.0073
City	41.16	40.16	-1.0	-0.025	
Suburban	40.99	41.66	0.7	0.016	
Town	6.99	8.74	1.8	0.251	
Rural	10.85	9.44	-1.4	-0.130	
Enrollment size class					0.8134
Large (≥ 28)	48.90	47.85	-1.0	-0.021	
Medium (15-27)	27.55	28.10	0.5	0.020	
Small (≤ 14)	23.55	24.05	0.5	0.021	

NOTE: Size-adjusted school weights were used.

Table A-6. 2017 NAEP grade 4 nonresponse-adjusted sample - weighted mean values of various characteristics for full sample and responding schools - all private schools (sample size = 479)

	Full sample mean	Respondent mean	Bias	Relative bias	T-test p-value
Size of school attended by average student	33.58	32.34	-1.2	-0.037	0.268
Grade enrollment	17.75	17.89	0.1	0.008	0.826
Race/ethnicity					
Percentage White, not Hispanic	69.30	65.76	-3.5	-0.051	0.003
Percentage Black, not Hispanic	9.18	11.57	2.4	0.261	0.004
Percentage Hispanic heritage	11.60	12.05	0.5	0.039	0.493
Percentage Asian	5.27	5.77	0.5	0.097	0.366
Percentage American Indian/Alaskan Native	0.31	0.22	-0.1	-0.272	0.254
Percentage Native Hawaiian/Pacific Islander	0.48	0.50	0.0	0.031	0.720
Percentage Two or more race	3.87	4.12	0.2	0.064	0.444

NOTE: For the mean of school size attended by average student and the race/ethnicity percentages, size-adjusted school weights were used. For the mean of enrollment, school weights were used.

Table A-7. 2017 NAEP grade 8 original sample - weighted percentages of full sample and responding schools by various subgroups - all private schools (sample size = 492)

	Full sample weighted percentage	Respondent weighted percentage	Bias	Relative bias	Chi-square p-value
Census region					0.4315
Northeast	20.85	19.19	-1.7	-0.080	
Midwest	25.54	27.75	2.2	0.086	
South	36.39	36.53	0.1	0.004	
West	17.22	16.52	-0.7	-0.040	
Private school reporting subgroup					<.0001
Roman Catholic	43.58	63.51	19.9	0.457	
Non-Catholic Private	56.42	36.49	-19.9	-0.353	
Urban-centric locale					0.0269
City	42.06	44.07	2.0	0.048	
Suburban	39.48	41.13	1.6	0.042	
Town	6.27	6.56	0.3	0.046	
Rural	12.19	8.25	-3.9	-0.324	
Enrollment size class					0.0353
Large (≥ 30)	56.82	57.82	1.0	0.018	
Medium (16-29)	24.39	26.77	2.4	0.097	
Small (≤ 15)	18.78	15.41	-3.4	-0.180	

NOTE: Size-adjusted school weights were used.

Table A-8. 2017 NAEP grade 8 original sample - weighted mean values of various characteristics for full sample and responding schools - all private schools (sample size = 492)

	Full sample mean	Respondent mean	Bias	Relative bias	T-test p-value
Size of school attended by average student	43.67	41.75	-1.9	-0.044	0.325
Grade enrollment	19.53	22.41	2.9	0.147	0.001
Race/ethnicity					
Percentage White, not Hispanic	71.81	69.18	-2.6	-0.037	0.010
Percentage Black, not Hispanic	7.63	7.69	0.1	0.008	0.900
Percentage Hispanic heritage	9.89	11.61	1.7	0.174	0.005
Percentage Asian	5.59	6.14	0.5	0.097	0.133
Percentage American Indian/Alaskan Native	0.79	1.02	0.2	0.290	0.314
Percentage Native Hawaiian/Pacific Islander	0.58	0.52	-0.1	-0.090	0.645
Percentage Two or more race	3.72	3.84	0.1	0.032	0.558

NOTE: For the mean of school size attended by average student and the race/ethnicity percentages, size-adjusted school weights were used. For the mean of enrollment, school weights were used.

Table A-9. 2017 NAEP grade 8 sample with substitutes - weighted percentages of full sample and responding schools by various subgroups - all private schools (sample size = 492)

	Full sample weighted percentage	Respondent weighted percentage	Bias	Relative bias	Chi-square p-value
Census region					0.0051
Northeast	20.85	17.88	-3.0	-0.142	
Midwest	25.54	29.15	3.6	0.141	
South	36.39	36.76	0.4	0.010	
West	17.22	16.21	-1.0	-0.059	
Private school reporting subgroup					<.0001
Roman Catholic	43.58	59.31	15.7	0.361	
Non-Catholic Private	56.42	40.69	-15.7	-0.279	
Urban-centric locale					0.0059
City	42.06	43.14	1.1	0.026	
Suburban	39.48	41.09	1.6	0.041	
Town	6.27	7.02	0.8	0.120	
Rural	12.19	8.75	-3.4	-0.282	
Enrollment size class					0.0310
Large (≥ 30)	56.82	57.76	0.9	0.016	
Medium (16-29)	24.39	26.02	1.6	0.067	
Small (≤ 15)	18.78	16.22	-2.6	-0.136	

NOTE: Size-adjusted school weights were used.

Table A-10. 2017 NAEP grade 8 sample with substitutes - weighted mean values of various characteristics for full sample and responding schools - all private schools (sample size = 492)

	Full Sample mean	Respondent mean	Bias	Relative bias	T-test p-value
Size of school attended by average student	43.67	41.28	-2.4	-0.055	0.135
Grade enrollment	19.53	21.90	2.4	0.121	0.001
Race/ethnicity					
Percentage White, not Hispanic	71.81	69.51	-2.3	-0.032	0.010
Percentage Black, not Hispanic	7.63	8.02	0.4	0.052	0.428
Percentage Hispanic heritage	9.89	11.20	1.3	0.133	0.011
Percentage Asian	5.59	6.00	0.4	0.072	0.192
Percentage American Indian/Alaskan Native	0.79	0.90	0.1	0.142	0.471
Percentage Native Hawaiian/Pacific Islander	0.58	0.48	-0.1	-0.172	0.397
Percentage Two or more race	3.72	3.89	0.2	0.045	0.436

NOTE: For the mean of school size attended by average student and the race/ethnicity percentages, size-adjusted school weights were used. For the mean of enrollment, school weights were used.

Table A-11. 2017 NAEP grade 8 nonresponse-adjusted sample - weighted percentages of full sample and responding schools by various subgroups - all private schools (sample size = 492)

	Full sample weighted percentage	Respondent weighted percentage	Bias	Relative bias	Chi-square p-value
Census region					1.0000
Northeast	20.85	20.85	0.0	0.000	
Midwest	25.54	25.54	0.0	0.000	
South	36.39	36.39	0.0	0.000	
West	17.22	17.22	0.0	0.000	
Private school reporting subgroup					1.0000
Roman Catholic	43.58	43.58	0.0	0.000	
Non-Catholic Private	56.42	56.42	0.0	0.000	
Urban-centric locale					0.0875
City	42.06	41.19	-0.9	-0.020	
Suburban	39.48	40.96	1.5	0.037	
Town	6.27	7.33	1.1	0.169	
Rural	12.19	10.52	-1.7	-0.137	
Enrollment size class					0.1593
Large (≥ 30)	56.82	53.24	-3.6	-0.063	
Medium (16-29)	24.39	25.40	1.0	0.041	
Small (≤ 15)	18.78	21.36	2.6	0.137	

NOTE: Size-adjusted school weights were used.

Table A-12. 2017 NAEP grade 8 nonresponse-adjusted sample - weighted mean values of various characteristics for full sample and responding schools - all private schools (sample size = 492)

	Full sample mean	Respondent mean	Bias	Relative bias	T-test p-value
Size of school attended by average student	43.67	38.10	-5.6	-0.127	0.002
Grade enrollment	19.53	19.14	-0.4	-0.020	0.644
Race/ethnicity					
Percentage White, not Hispanic	71.81	70.07	-1.7	-0.024	0.094
Percentage Black, not Hispanic	7.63	8.43	0.8	0.105	0.310
Percentage Hispanic heritage	9.89	10.21	0.3	0.032	0.530
Percentage Asian	5.59	6.09	0.5	0.088	0.213
Percentage American Indian/Alaskan Native	0.79	0.72	-0.1	-0.092	0.435
Percentage Native Hawaiian/Pacific Islander	0.58	0.44	-0.1	-0.236	0.248
Percentage Two or more race	3.72	4.06	0.3	0.091	0.261

NOTE: For the mean of school size attended by average student and the race/ethnicity percentages, size-adjusted school weights were used. For the mean of enrollment, school weights were used.

Appendix B

Student Tables

Table B-1. 2017 NAEP Grade 8 - Weighted percentages of full sample and responding students by various subgroups – Public School Students in New York Mathematics (sample size =4343)

	Full sample weighted percentage	Respondent weighted percentage	Bias	Relative bias	Chi-square p-value
Sex					0.2387
Male	49.95	50.44	0.5	0.010	
Female	50.05	49.56	-0.5	-0.010	
Race					0.0035
White, not Hispanic	49.76	47.86	-1.9	-0.038	
Black, not Hispanic	16.97	17.61	0.6	0.038	
Hispanic Heritage	22.90	23.40	0.5	0.022	
Asian, not Hispanic	8.81	9.63	0.8	0.093	
American Indian/Alaskan Native	0.31	0.25	-0.1	-0.179	
Pacific Islander, not Hispanic	0.03	0.02	0.0	-0.361	
2 or more race	1.24	1.24	0.0	0.002	
Relative Age					0.5223
Old (Born in 9/2002 or earlier)	10.39	10.21	-0.2	-0.017	
Not old (Born in 10/2002 or later)	89.61	89.79	0.2	0.002	
Free Lunch Eligibility					0.0120
Student Not Eligible	49.32	48.00	-1.3	-0.027	
Free or Reduced Lunch	49.35	50.67	1.3	0.027	
Missing	1.33	1.33	0.0	0.006	
SD					<.0001
Yes	17.28	16.05	-1.2	-0.071	
No	82.72	83.95	1.2	0.015	
ELL					0.1666
Yes	5.89	6.18	0.3	0.049	
No	94.11	93.82	-0.3	-0.003	

Table B-2. 2017 NAEP Nonresponse-Adjusted Public Grade 8 - Weighted percentages of full sample and responding students by various subgroups – Public School Students in New York Mathematics (sample size =4343)

	Full sample weighted percentage	Respondent weighted percentage	Bias	Relative bias	Chi-square p-value
Sex					0.5664
Male	49.95	50.19	0.2	0.005	
Female	50.05	49.81	-0.2	-0.005	
Race					0.5296
White, not Hispanic	49.76	49.33	-0.4	-0.009	
Black, not Hispanic	16.97	17.13	0.2	0.010	
Hispanic Heritage	22.90	23.16	0.3	0.011	
Asian, not Hispanic	8.81	8.84	0.0	0.004	
American Indian/Alaskan Native	0.31	0.24	-0.1	-0.220	
Pacific Islander, not Hispanic	0.03	0.01	0.0	-0.409	
2 or more race	1.24	1.29	0.1	0.041	
Relative Age					0.8364
Old (Born in 9/2002 or earlier)	10.39	10.34	0.0	-0.004	
Not old (Born in 10/2002 or later)	89.61	89.66	0.0	0.001	
Free Lunch Eligibility					0.2613
Student Not Eligible	49.32	48.75	-0.6	-0.012	
Free or Reduced Lunch	49.35	49.88	0.5	0.011	
Missing	1.33	1.37	0.0	0.033	
SD					0.1988
Yes	17.28	17.05	-0.2	-0.013	
No	82.72	82.95	0.2	0.003	
ELL					0.2024
Yes	5.89	6.16	0.3	0.045	
No	94.11	93.84	-0.3	-0.003	

Table B-3. 2017 NAEP Grade 8 - Weighted percentages of full sample and responding students by various subgroups – Public School Students in New York Reading (sample size =4230)

	Full sample weighted percentage	Respondent weighted percentage	Bias	Relative bias	Chi-square p-value
Sex					0.1119
Male	51.36	52.06	0.7	0.014	
Female	48.64	47.94	-0.7	-0.014	
Race					<.0001
White, not Hispanic	49.32	47.66	-1.7	-0.034	
Black, not Hispanic	16.37	16.81	0.4	0.027	
Hispanic Heritage	23.27	23.48	0.2	0.009	
Asian, not Hispanic	9.28	10.35	1.1	0.115	
American Indian/Alaskan Native	0.33	0.30	0.0	-0.090	
Pacific Islander, not Hispanic	0.10	0.12	0.0	0.189	
2 or more race	1.34	1.29	0.0	-0.037	
Relative Age					0.5342
Old (Born in 9/2002 or earlier)	11.03	10.85	-0.2	-0.016	
Not old (Born in 10/2002 or later)	88.97	89.15	0.2	0.002	
Free Lunch Eligibility					0.0066
Student Not Eligible	49.66	48.31	-1.3	-0.027	
Free or Reduced Lunch	49.25	50.58	1.3	0.027	
Missing	1.09	1.11	0.0	0.019	
SD					0.0004
Yes	16.99	15.85	-1.1	-0.067	
No	83.01	84.15	1.1	0.014	
ELL					0.6443
Yes	5.87	5.96	0.1	0.017	
No	94.13	94.04	-0.1	-0.001	

Table B-4. 2017 NAEP Nonresponse-Adjusted Public Grade 8 - Weighted percentages of full sample and responding students by various subgroups – Public School Students in New York Reading (sample size =4230)

	Full sample weighted percentage	Respondent weighted percentage	Bias	Relative bias	Chi-square p-value
Sex					0.1379
Male	51.36	51.95	0.6	0.011	
Female	48.64	48.05	-0.6	-0.012	
Race					0.4951
White, not Hispanic	49.32	49.07	-0.2	-0.005	
Black, not Hispanic	16.37	16.29	-0.1	-0.005	
Hispanic Heritage	23.27	23.32	0.0	0.002	
Asian, not Hispanic	9.28	9.61	0.3	0.036	
American Indian/Alaskan Native	0.33	0.30	0.0	-0.089	
Pacific Islander, not Hispanic	0.10	0.13	0.0	0.297	
2 or more race	1.34	1.28	-0.1	-0.045	
Relative Age					0.6951
Old (Born in 9/2002 or earlier)	11.03	10.94	-0.1	-0.008	
Not old (Born in 10/2002 or later)	88.97	89.06	0.1	0.001	
Free Lunch Eligibility					0.2754
Student Not Eligible	49.66	49.11	-0.5	-0.011	
Free or Reduced Lunch	49.25	49.77	0.5	0.010	
Missing	1.09	1.12	0.0	0.028	
SD					0.2436
Yes	16.99	16.77	-0.2	-0.013	
No	83.01	83.23	0.2	0.003	
ELL					0.3909
Yes	5.87	6.05	0.2	0.031	
No	94.13	93.95	-0.2	-0.002	

Table B-5. 2017 NAEP Grade 8 - Weighted percentages of full sample and responding students by various subgroups - Public School Students in Washington, DC TUDA Mathematics (sample size =1132)

	Full sample weighted percentage	Respondent weighted percentage	Bias	Relative bias	Chi-square p-value
Sex					0.1738
Male	53.09	52.14	-0.9	-0.018	
Female	46.91	47.86	0.9	0.020	
Race					0.0011
White, not Hispanic	12.45	13.68	1.2	0.099	
Black, not Hispanic	67.07	65.23	-1.8	-0.027	
Hispanic Heritage	16.07	16.50	0.4	0.027	
Asian, not Hispanic	2.38	2.30	-0.1	-0.036	
American Indian/Alaskan Native	0.09	0.10	0.0	0.183	
Pacific Islander, not Hispanic	0.26	0.31	0.0	0.183	
2 or more race	1.68	1.88	0.2	0.121	
Relative Age					0.0381
Old (Born in 9/2002 or earlier)	15.11	14.00	-1.1	-0.073	
Not old (Born in 10/2002 or later)	84.89	86.00	1.1	0.013	
Free Lunch Eligibility					0.0011
Student Not Eligible	28.43	30.39	2.0	0.069	
Free or Reduced Lunch	71.57	69.61	-2.0	-0.027	
Missing	0.00	0.00	0.0	N/A	
SD					0.4017
Yes	16.51	16.08	-0.4	-0.026	
No	83.49	83.92	0.4	0.005	
ELL					0.2788
Yes	8.74	8.35	-0.4	-0.044	
No	91.26	91.65	0.4	0.004	

Table B-6. 2017 NAEP Nonresponse-Adjusted Public Grade 8 - Weighted percentages of full sample and responding students by various subgroups - Public School Students in Washington, DC TUDA Mathematics (sample size = 1132)

	Full sample weighted percentage	Respondent weighted percentage	Bias	Relative bias	Chi-square p-value
Sex					0.5694
Male	53.09	52.80	-0.3	-0.006	
Female	46.91	47.20	0.3	0.006	
Race					0.4389
White, not Hispanic	12.45	12.78	0.3	0.027	
Black, not Hispanic	67.07	66.95	-0.1	-0.002	
Hispanic Heritage	16.07	15.96	-0.1	-0.007	
Asian, not Hispanic	2.38	2.17	-0.2	-0.087	
American Indian/Alaskan Native	0.09	0.10	0.0	0.162	
Pacific Islander, not Hispanic	0.26	0.31	0.0	0.162	
2 or more race	1.68	1.72	0.0	0.027	
Relative Age					0.5218
Old (Born in 9/2002 or earlier)	15.11	14.84	-0.3	-0.017	
Not old (Born in 10/2002 or later)	84.89	85.16	0.3	0.003	
Free Lunch Eligibility					0.9467
Student Not Eligible	28.43	28.40	0.0	-0.001	
Free or Reduced Lunch	71.57	71.60	0.0	0.000	
Missing	0.00	0.00	0.0	N/A	
SD					0.0071
Yes	16.51	17.28	0.8	0.047	
No	83.49	82.72	-0.8	-0.009	
ELL					0.3375
Yes	8.74	8.50	-0.2	-0.028	
No	91.26	91.50	0.2	0.003	