ETS NAEP Technical and Research Report Series

Including Special-Needs Students in the NAEP 1998 Reading Assessment Part II

Results for Students with Disabilities and Limited-English Proficient Students

Anthony D. Lutkus

in collaboration with

John Mazzeo, Jinming Zhang, and Laura Jerry

March 2004

Research Report

ETS-NAEP 04-R01

Listening.
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Background

The National Assessment of Educational Progress (NAEP) is the nation's only ongoing representative sample survey of student achievement in core subject areas. Authorized by Congress, administered by the National Center for Education Statistics (NCES) in the U.S. Department of Education, and overseen by the National Assessment Governing Board (NAGB), NAEP regularly reports to the public on the educational progress of students in grades 4, 8, and 12.

Because NAEP's purpose is to report on what students know and can do, it is important that the NAEP student samples and assessment results represent the performance of all students. This includes the performance of special-needs students—students with disabilities (SD) and limited-English-proficient (LEP) students. Although the intent of NAEP has consistently been to include special-needs students in its assessments to the fullest degree possible, the implementation of assessments has resulted in some exclusion of students with disabilities and LEP students. In order to participate in the NAEP assessments, some special-needs students require accommodations in the test administration. In 1996, NAEP began offering accommodations on a trial basis and conducting research to explore possible psychometric effects that the inclusion of more special-needs students might have on assessment results in various subject areas.

Results from the NAEP 1998 reading assessment were reported in the reading report card. The report card included national results for fourth-, eighth-, and twelfth-graders, as well as results for fourth- and eighth-graders in those jurisdictions (including states, the U.S. Virgin Islands, the Department of Defense Domestic Department of Elementary and Secondary Schools (DDESS), the Department of Defense Dependents Schools (Overseas) (DoDDS), and the District of Columbia) that volunteered to participate in state-level assessments. In order to allow comparisons with results in 1992 and 1994, when accommodations were not offered, the report card did not include 1998 results for students who were tested with accommodations. Part I of this report series presented results that were not included in the report card and examined issues related to the inclusion rates of accommodated students on a state-by-state basis.[1] This report (Part II) examines the performance of students with disabilities and LEP students separately from the performance on non-SD/LEP students.

Purpose of This Report

The two purposes of this report are 1) to apply a special variant of differential item functioning (DIF) analyses to the NAEP test questions taken by special-needs students, and 2) to display NAEP reading performance data for students with disabilities and LEP students separately, using

[1] Lutkus, A. D., and Mazzeo, J. (2003) *Including special-needs students in the NAEP 1998 reading assessment, Part I comparison of overall results with and without accommodations* (NCES 2003–467). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics.

the aggregated national public school and state samples. The DIF analysis was used to address the issue of whether NAEP's assessment constructs remain comparable for the accommodated and nonaccommodated students within the special-needs groups. This is the only NAEP report on the 1998 reading assessment to display the performance results for students with disabilities and LEP students in terms of scale scores and achievement levels without combining them with the results for non-SD/LEP students. This report also uses a combined national and state sample for reporting NAEP results. The larger, combined sample sizes permitted analyses of the results by such variables as type of accommodation, severity of disability, and years of instruction in English for LEP students. Combining national and state NAEP data became standard practice beginning with the NAEP 2002 report series.

Results of DIF Analyses

The DIF analyses covered both multiple-choice and constructed-response questions that were administered in a common booklet to all special-needs students and to a proportion of non-SD/LEP students. The DIF analyses were employed in a somewhat nontraditional manner in that the focal and reference groups of interest here were the accommodated and nonaccommodated (within students with disabilities and within LEP) groups, respectively. The traditional use of DIF would have been to make comparisons of item performance between majority and minority groups, or majority and SD/LEP groups. The purpose here, however, was to assess, to the extent possible with this statistical tool, the relative invariance of NAEP item construct validity for the nonaccommodated and accommodated special-needs students. In other words, did the various NAEP assessment questions appear to measure the same thing for accommodated students compared with nonaccommodated special-needs students?

- Very few of the test questions were found to have statistically significant differential item performance for accommodated versus nonaccommodated special-needs students. In two cases at grade 8 where the LEP-accommodated groups showed statistically significant DIF results, the advantages were in both positive and negative directions (i.e., one dichotomous item was differentially easier for the LEP-accommodated students and one polytomous item was harder for them).
- The overall lack of DIF findings over the aggregated sample leads to the conclusion that providing accommodations for both students with disabilities and LEP students will have no major effect on the reported aggregate results. This finding may be specific to the subject of reading for LEP students, however, because NAEP reading assessments do not permit Spanish translation test booklets, while other subjects, such as mathematics, allow translated test booklets.

Results for Students with Disabilities

Combining the national and state samples at grades 4 and 8 resulted in samples of approximately 100,000 students. Students with disabilities represented a weighted percentage of 7 percent at both grades. At each grade, 3 percent of all students were tested with accommodations.

Overall

- The overall average NAEP scale scores for students with disabilities (SD) were significantly below those of non-SD/LEP students. The magnitude of the difference (approximately 33 to 36 scale score points on NAEP's 500 point scale) between non-SD/LEP students and students with disabilities tested without accommodations was comparable to the difference between White and Black students or between White and Hispanic students as reported in the NAEP 1998 reading report card.
- At grade 8, students with disabilities who tested without accommodations had higher scores than those who received accommodations. At grade 4, the apparent difference was not found to be statistically significant.
- Accommodated students with disabilities at grade 8 had lower percentages at or above the *Basic* and *Proficient* achievement levels than nonaccommodated students with disabilities.

Gender

- Among students with disabilities, both male and female students in the nonaccommodated group had higher average scores than the group that received accommodations. At grade 4, however, apparent differences were not found to be statistically significant.
- Female students with disabilities had higher scores than male students with disabilities at grade 8, but not at grade 4.

Type of Disability

- At grade 8, students with hearing, speech, and visual impairments had higher average scores than students with learning disabilities and/or mental/cognitive, emotional, and multiple disabilities. At grade 4, none of the apparent differences in average reading scores between students with disabilities of varying types of disabilities was found to be significant.

Severity of Disability

- About three-quarters of students with disabilities at grades 4 and 8 were estimated to have either mild or moderate disabilities.
- At both grades 4 and 8, students with disabilities identified as having mild disabilities had higher average scores than those identified as having moderate or profound disabilities.
- At grade 8, students identified as having moderate disabilities who were tested without accommodations had higher scores than those tested with accommodations.

Learning Disabled (LD)

- Within the students with disabilities group, the learning disability category represented 50 percent of students at grade 4 and 62 percent at grade 8.
- Male students comprised 70 percent of LD students at grade 4 and 67 percent at grade 8.
- Similar to the results for the students with disabilities group overall, LD students identified as having mild disabilities had higher average scale scores than those identified as having moderate or profound/severe disabilities at both grades 4 and 8.
- Within the LD group at grade 8, the students who tested without accommodations had a higher average score than the LD students who tested with accommodations.
- Within the LD category, nonaccommodated female students at grade 8 had higher average scores than male students, a pattern similar to that for the non-SD/LEP students.

Accommodation Type

- Extended-time and small-group testing were the accommodations received most frequently by students with disabilities, in both grades 4 and 8.
- There were no statistically significant differences in average scale scores in either grade by type of accommodation where samples were large enough to carry out significance tests.

Results for Limited-English-Proficient Students

LEP students comprised 4 percent of the total assessed at grade 4, and 3 percent at grade 8. Accommodation rates for LD students in the reading assessment were low. Accommodated LEP students made up less than one percent of all students at both grades 4 and 8.

Overall

- While students with disabilities were fairly evenly distributed across NAEP's four geographic regions, LEP students at both grades 4 and 8 were concentrated in the western region of the country. Seventy-nine to 81 percent of the LEP students came from states in the western region.
- The average scale score point differences between non-SD/LEP students and LEP-only students (43 points at grade 4 and 41 points at grade 8) should be put in context with the 33–36 average score point differences between the non-SD/LEP students and those who were only students with disabilities mentioned previously. Again, the order of magnitude of these differences is comparable to the differences between White, Black, or Hispanic students on the same reading scale.
- At both grades, non-SD/LEP students had higher percentages than LEP students at or above the *Basic* and *Proficient* levels. The percentage of fourth-graders at *Advanced* was also higher for the non-SD/LEP students than for LEP-only students.

Gender

- Non-SD/LEP male and female students, at both grades 4 and 8 had higher scores than male and female LEP-only students, respectively. This finding mirrored a similar finding of non-SD/LEP students outperforming counterparts in the SD-only group.
- The apparent average scale score differences in favor of females over males in the LEP-only group and differences between nonaccommodated and accommodated groups were in the same direction as in the students with disabilities group, but none reached statistical significance in the LEP student groups.

Years Receiving Instruction in English

- School personnel were asked in what language a student could best demonstrate reading ability. At grade 8, LEP students who had four or more years of instruction in English scored higher, on average, than those who had two years of instruction in English.

Performance by Students Best Language by School's Estimation

- School personnel were asked in what language a student could best demonstrate reading ability. At both grades 4 and 8, average scores for LEP students for whom school personnel responded "English" appeared higher than scores for students for whom response was "Spanish," but the apparent differences were not found to reach statistical significance.

Accommodation Type

- Extended testing time was the predominant accommodation for LEP students who were tested with an accommodation.
- Of LEP-only students at grades 4 and 8, approximately 10 percent were tested with an accommodation. Sample sizes of the accommodated LEP students were insufficient for reliable statistical testing of subgroups.

Chapter 1

Introduction

This document is the second of two reports for the National Center for Education Statistics (NCES) on the performance of special-needs students in the 1998 National Assessment of Educational Progress (NAEP) reading assessment. The first report, *Including Special-Needs Students in the NAEP 1998 Reading Assessment: Part I, Comparison of Overall Results With and Without Accommodations*, presented selected, recalculated results of the *NAEP 1998 Reading Report Card for the Nation and the States* so that the results for accommodated special-needs students were included in the total reporting sample.[1] This second report (Part II), presents analyses of the NAEP 1998 reading assessment data for special-needs students separate from the results for non-special-needs students, and uses a combined sample of national and state-level public school NAEP results at grades 4 and 8.

Overview of NAEP

Also known as the Nation's Report Card, NAEP, which uses nationally representative student samples, conducts the only continuing evaluation of what America's students know and can do in various subject areas. The 1998 assessments resulted in the publication of report cards on the academic performance of students in reading, writing, and civics. In addition, long term trend assessments in reading, mathematics, and science for students aged 9, 13, and 17 have been administered on a regular schedule for more than 30 years to evaluate trends in students' academic achievement. All the NAEP assessments are authorized by Congress and administered by NCES, within the U.S. Department of Education. Policy guidance for NAEP is provided by the National Assessment Governing Board (NAGB).

NAEP and Special-Needs Students

Because the purpose of NAEP is to report on what students in the nation and participating jurisdictions know and can do, it is important that the NAEP student samples and assessment results represent the educational attainment of all students. This includes special-needs students—students with disabilities (SD) and limited-English-proficient (LEP) students. The NAEP 1998 reading report card for the nation included the results for special-needs students who could be tested without accommodations along with the results for all those who needed accommodations.[2] However, the results for special-needs students who tested with

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[1] Lutkus, A. D., and Mazzeo, J (2003). *Including special-needs students in the NAEP 1998 reading assessment, Part I, comparison of overall results with and without accommodations* (NCES 2003-467). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics; Donahue, P. L., Voelkl, K. R., Campbell, J. R., and Mazzeo, J. (1999). *The NAEP 1998 reading report card for the nation and the states* (NCES 1999-500). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

[2] Donahue, P. L., Voelkl, K. R., Campbell, J. R., and Mazzeo, J. (1999). *The NAEP 1998 reading report card for the nation and the states* (NCES 1999-500). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

accommodations were not included in the reading report card so that the overall results would be comparable with the results from the two previous reading assessments. As noted above, Part I of this series on the 1998 reading assessment provided the recalculated results for the NAEP 1998 reading report card for the nation, by incorporating the data for accommodated special-needs students. The previous research report also examined, state-by-state, the impact of the varying exclusion rates of special-needs students.

Student Exclusions from Assessment

Although the intent of NAEP has consistently been to include special-needs students in its assessments to the fullest degree possible, the implementation of the assessment has always resulted in some exclusion of SD/LEP students. In 1998, NAEP assessed 31,398 public and non public school students in the national sample in grades 4, 8, and 12.[3] Of the students identified to be assessed in reading in 1998, 16 percent were identified as students with disabilities and/or LEP in fourth grade, 12 percent in eighth grade, and 7 percent in twelfth grade. Accommodations in testing were not offered to those special-needs students in the samples for which data were reported. Thus, of the 16 percent identified as special-needs students in fourth grade, 9 percent were excluded from the assessment; in eighth grade, 6 percent were excluded; and, in twelfth grade, 3 percent were excluded. For the combined national and state sample of approximately 100,000 students per grade used in this report, students identified as students with disabilities and/or LEP comprised 18 percent at grade 4 and 14 percent at grade 8. At fourth grade, 8 percent were excluded, 3 percent were tested with accommodations, and 7 percent were assessed under standard conditions. At eighth grade, 4 percent were excluded, 3 percent were tested with accommodations, and 7 percent were assessed under standard conditions.

For some time NAEP has provided uniform guidelines for inclusion of students in its assessments. Because of the voluntary nature of the program, the implementation of the guidelines depends on decisions made by local school personnel in accordance with state and local policies on exclusion. Decisions on student exclusion can vary from district to district, state to state, and over time, depending on individual states' efforts to comply with federal legislative mandates in this area. These variations can complicate the interpretation of national and state trends in performance results, as well as the comparisons of performance results across jurisdictions.

The 1998 NAEP Reading Assessment: Exclusion Criteria and the Provision of Accommodations

Since the inception of the state NAEP program, staff from participating schools have been permitted to exclude certain students with disabilities (more specifically, students with an Individualized Education Plan (IEP) or students who are receiving services under Section 504 of the Rehabilitation Act of 1973 (Pub. L. No. 93-112)). Similarly, schools have been permitted to exclude students they identify as being LEP. Exclusion decisions are to be made in accordance with explicit criteria provided by NAEP. The exclusion criteria used by NAEP in its 1992 and 1994 reading assessments were identical. The criteria were subsequently revised and used on a

[3] Ibid.

trial basis in 1996 for the mathematics assessment and operationally in 1996 and 1998 for the science and reading assessments, respectively. The revised inclusion criteria were developed with advice from a number of federal government offices and experts in the field. The goals of the revision were to 1) achieve greater inclusion for students with disabilities, 2) better align NAEP inclusion rules for limited-English-proficient students with those of state testing programs, 3) strengthen the relationship between subject-related instructional practices and inclusion decisions; and 4) encourage greater consistency in the implementation of criteria across jurisdictions. Figure 1.1 summarizes the criteria used for the NAEP 1998 national and state reading assessments. In all assessment years, schools were advised to include a student in the assessment if there was doubt whether he or she could participate.

Figure 1.1—NAEP inclusion criteria: 1998

	Students with disabilities (SD)	Limited-English-proficient (LEP) students
	Should be included unless: • The school's IEP team determined that the student could not participate, or • The student's cognitive functioning was so severely disabled that she or he could not participate, or • The student's IEP (or 504 plan) required that the student be tested with an accommodation or adaptation not offered by NAEP, and that the student could not demonstrate his or her knowledge without that accommodation.	**Should be included unless:** • Receiving academic instruction in English for less than three years, and • Judged to be incapable of participating in the assessment in English.

NOTE: IEP=Individualized Education Program

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

In 1998, the national and state NAEP school samples were divided into two randomly equivalent halves. In one-half of the schools, the assessment was conducted using the inclusion criteria shown in figure 1.1 and accommodations were not permitted. In the other half-sample of schools, accommodations were permitted for students with disabilities and/or LEP students, if they normally received them in their district or state testing programs. Most accommodations that schools routinely provided for their own testing were permitted. Among the permitted accommodations were

one-on-one testing,
small-group testing,
extended time,
oral reading of directions,
signing of directions,
use of magnifying equipment, and
use of an aide for transcribing responses.

Some other accommodations that are permitted in certain states were not allowed by NAEP. In particular, some states allow questions and, in some instances, reading passages to be read aloud to the students. These accommodations were viewed by NAEP as changing the nature of the construct being measured and, hence, were not permitted. Because NAEP considers the domain of its reading assessment to be reading in English, no attempt was made to provide an alternate-language version of the instrument, and the use of bilingual dictionaries was not allowed.

Becoming a More Inclusive NAEP

NAEP has been working greater inclusion of special-needs students in its assessments. To increase inclusion, NAEP has completed a phased transition that started with the NAEP 1995 field test in reading. The first phase of the transition was the introduction of the revised criteria (shown in figure 1.1) to be used in making exclusion decisions about sampled students along with offering accommodations on a trial basis in 1996. The second phase was the decision to conduct the national and state reading assessments in 1998 with split samples: 1) one set of schools in which no accommodations were offered, and 2) another set in which accommodations were offered to students who normally received them in their state assessments. This was done because of concerns about the generalizability of the psychometric results across the subject areas assessed by NAEP, and in recognition of the absence of program experience with offering accommodations in the state NAEP program. Both samples used the revised exclusion criteria that were introduced in 1996. Splitting the sample allowed continued study of the technical issues associated with the analysis of results from accommodated testing, while at the same time maintaining the trend data from the previous assessment (without accommodations). Data from both samples (with the accommodated special-needs students omitted) were combined and used to calculate the results in the 1998 reading report card.[4] The information in this paper is based on results from samples both with and without accommodations, combining both the national and the state public school samples.

Results from Part I on Including Results from Accommodated Special-Needs Students in the NAEP 1998 Reading Assessment

Research regarding inclusion of special-needs students initiated by NAEP has been focused on the maintenance of the trend lines (the core mission of the program in the face of evolving accommodation policies) and on resolving issues regarding the validity and reliability of its assessments. Part I presents recalculated data from the NAEP 1998 national and state reading assessments to evaluate how much change in results would have taken place had data from accommodated special-needs students been included in the national and state report cards. No significant changes in the average scores were observed in the national data for reading in 1998 when the accommodated special-needs students were incorporated at any of the three grades.

[4] Ibid.

However, in the state data at grade 4, there were 9 states whose average scores would have been lower had the accommodated special-needs student data been included. At grade 8, as was the case with the national sample, there were no statistically significant changes for any state when data for accommodated students were included. When the data for gender, race/ethnicity, and eligibility for free/reduced-price school lunch program examined, a similar pattern appeared—there were reductions in average scores for a small number of states in grade 4, and no statistically significant changes at grade 8.

Part I also examines the statistical relationship between exclusion rates in the state NAEP data and average reading scores. There was a relationship between the change in inclusion and difference in average scores. Jurisdictions that exhibited larger gains in inclusion (comparing the exclusion rates for nonaccommodated and accommodated samples) also tended to exhibit larger reductions in their average scores when accommodations were permitted. This negative correlation was more pronounced at fourth grade (-.72) than at eighth grade (-.52).

Purpose of This Report

This paper continues the research series initiated by NAEP to examine the effects on assessment results of including the data from special-needs students who are tested with appropriate accommodations.[5] The current report provides the results of differential item functioning (DIF) analyses, which address the issue of whether NAEP's assessment content constructs remain comparable for the accommodated and nonaccommodated special-needs groups. The reporting convention in NAEP report cards in subjects where trend lines were to be maintained has been to incorporate nonaccommodated students with disabilities/LEP student results, but not to display data for these small groups separately from the total sample. This report presents average scale score and achievement-level results for the students with disabilities and LEP students separately. In order to obtain sufficient sample sizes for DIF analysis, and to provide the most reliable results, the data reported here for the 1998 students with disabilities and LEP groups reflect the aggregation of all state data as well as the national public school sample. The larger, combined sample sizes also permitted some analysis of the results by such variables as type of accommodation, severity of disability, and years of instruction in English. These results are reported in chapters 3 and 4. While combining the previously independent NAEP samples into a larger aggregate yields sufficient sample sizes for the analyses in this report, there may be limitations to this post-assessment strategy. The national and state samples have differences in sample design, stratification variables and other features that may raise concerns even when special combined weighting procedures are used. As such, this report should be regarded as a first attempt to examine the performance of students with disabilities and LEP students with sample sizes large enough for subgroup analyses.

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[5] Anderson, N. E., Jenkins, F. F., and Miller, K. E. (1996). *NAEP inclusion criteria and testing accommodations: Findings from the NAEP 1995 field test in mathematics*. Princeton, NJ: Educational Testing Service; Olson, J. F. and Goldstein, A. A. (1997). *Increasing the inclusion of students with disabilities and limited-English-proficient students in large-scale assessments: A summary of recent progress* (NCES 97-482). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics; Mazzeo, J., Carlson, J. E., Voelkl, K. E., and Lutkus, A. D. (1999). *Increasing the participation of special-needs students in NAEP: A report on 1996 research activities* (NCES 2000-473). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

NAEP 1998 Reporting Samples

In 1998, the national and state reading assessments used identical test instruments and administration procedures with one principle exception. The national NAEP assessment sessions were conducted by a contractor (Westat), while the state NAEP assessments were conducted by school staff provided by the participating jurisdictions and trained by the contractor. The national and state NAEP samples were drawn separately; the national results were not the aggregation of the results from the participating state NAEP jurisdictions. National and state NAEP data were analyzed separately and then equated, so that results from both assessment programs could be reported on a common scale.[6]

Results of the reading assessment were reported for 43 jurisdictions (including states, U.S. territories, armed services schools, and the District of Columbia) for the fourth grade and 40 jurisdictions for the eighth grade. In a typical jurisdiction, representative samples of about 100 schools were selected and, within each school, random samples of approximately 25 students were administered the NAEP assessments. Thus, student sample sizes in a typical jurisdiction were about 2,500 for each NAEP subject. Smaller jurisdictions tended to have smaller school and student sample sizes.

While the samples in the 1998 national reading assessment included both public and nonpublic schools, the samples in the state assessment included only public schools. When the national and state samples were combined, only public school data were used. While nonpublic schools were included in the state samples, most states did not gain sufficient participation from these schools to report their data.

To ensure that sufficient data were available for the analyses, students with disabilities and LEP students were oversampled in the national sample of schools, and all students who received an accommodation at a given grade were administered the same NAEP assessment booklet. (The usual NAEP procedure of a spiraled set of test booklets encompassing a large set of test questions was modified for these samples.) The decision was made in order to gain greater experience with this modification to existing procedures in the context of smaller scale, more controlled conditions like those introduced experimentally with the 1996 national assessment. Figure 1.2 provides a display of the sample design for the 1998 reading assessment.

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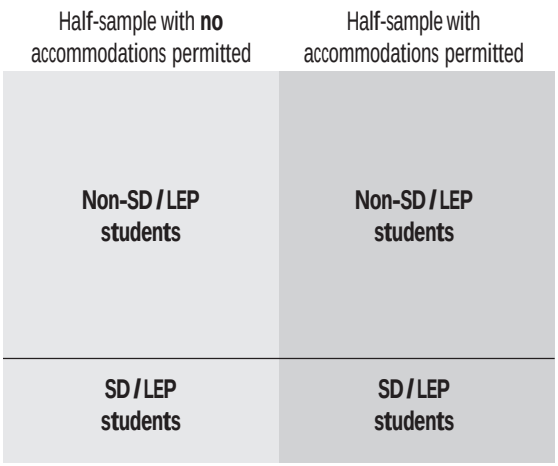
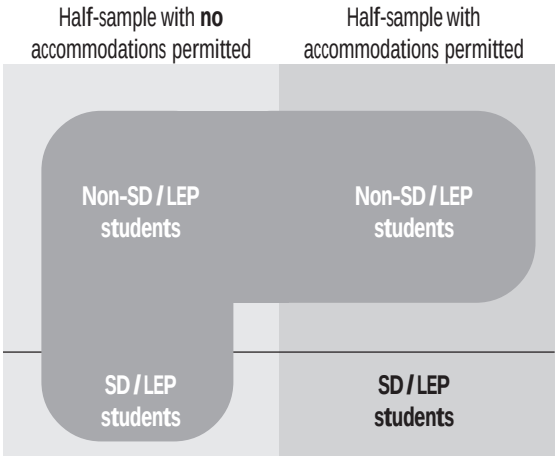
[6] For details on administration, sampling, and analysis of the NAEP 1998 assessments see Allen, N. L., Donoghue, J. R., and Schoeps, T. L. (2001). *The NAEP 1998 technical report* (NCES 2001-509). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

Figure 1.2—Illustrations of the two sets of NAEP results based on a split-sample design



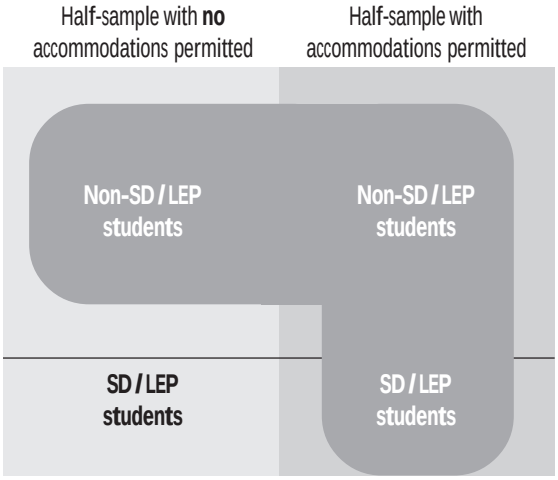
Split-sample design

The national and state samples were split. In half of the schools, accommodations were not permitted for students with disabilities (SD) and limited-English-proficient (LEP) students. In the other half of the schools, accommodations were permitted for students with disabilities and LEP students who routinely received them in their school assessments.



Accommodations-not-permitted results

The accommodations-not-permitted results include the performance of students from both half-samples who were not classified as students with disabilities or LEP students and the performance of students with disabilities and LEP students from the half-sample in which no accommodations were permitted.



Accommodations-permitted results

The accommodations-permitted results also include the performance of students from both half-samples who were not classified as students with disabilities or LEP students; however, the students with disabilities and LEP students whose performance is included in this set of results were from the half-sample in which accommodations were permitted. Since students who required testing accommodations could be assessed and represented in the overall results, it was anticipated that these results would include more special-needs students and reflect a more inclusive sample.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

All students with disabilities and LEP students were included or excluded from participation in the 1998 assessment using the revised criteria. Table 1.1 displays the sizes of the national samples. In each grade, the national samples reported for reading in 1998 in this design included A2+A3+B2 (i.e., *n* = 7,672 for grade 4). The samples used in this report, which focus on results for the accommodated students include A2+A3+B3 (i.e., *n* = 7,812 for grade 4). As shown in table 1.1, the students who received accommodations made up about 1 to 2 percent of the total in the national samples where accommodations were permitted in each grade. Sample sizes for the participating states and jurisdictions are presented in appendix C.

Table 1.1—Sample sizes for the NAEP 1998 national reading assessment, public and nonpublic schools combined, grades 4, 8, and 12: 1998

Sample type	Accommodations not permitted	Accommodations permitted
Grade 4	A2	A3
Non-SD/LEP	3,608	3,624
Assessed SD/LEP	B2	B3
Standard	440	413
Accommodated	0	167
Excluded	C2 545	C3 393
Total assessed	4,048	4,204
Grade 8	A2	A3
Non-SD/LEP	5,483	4,826
Assessed SD/LEP	B2	B3
Standard	742	678
Accommodated	0	206
Excluded	C2 623	C3 368
Total assessed	6,225	5,710
Grade 12	A2	A3
Non-SD/LEP	6,037	6,075
Assessed SD/LEP	B2	B3
Standard	563	532
Accommodated	0	116
Excluded	C2 448	C3 327
Total assessed	6,600	6,723

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Analysis Methods for the Present Study

Because of the split sample design described previously, two separate estimates of 1998 assessment results were available for the nation and each participating state and other jurisdiction. As described in the previous section, and referring to table 1.1, one estimate excludes accommodated students (i.e., A2+A3+B2), while the other estimate includes accommodated students (i.e., A2+A3+B3). All analyses were conducted using two distinct sets of sampling weights. One set allowed for the production of estimates without accommodations and another set allowed for the production of estimates with accommodations. Both sets of weights accounted for 1) the school sampling design; 2) school refusals; 3) the student sampling design, specifically the oversampling of students with disabilities and LEP students; and 4) student absenteeism. In addition, both sets of weights were accompanied by a matching set of replicate weights that were used to produce jackknife standard errors for all quantities estimated.[7]

It is important to note that student exclusions and absentees were treated differently. Data from absentees (i.e., students who were scheduled to be assessed, but were not) had an indirect impact on the calculation of NAEP results. Specifically, demographic data from absentees affected the weights used to analyze the data from the assessed students through student nonresponse adjustments. Data on excluded students had no impact on the calculation of results.[8]

Excluded SD/LEP students are, in essence, treated as outside the target population of inference. In fact, the results currently produced in NAEP technically generalize only to the population of assessed and absent students. In essence, the target population vary to the degree that the exclusion rates vary. Such variation complicates the interpretability of comparisons of results across time and across jurisdictions.

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[7] Details on the calculations of weights and jackknife procedures for obtaining standard errors are available in Allen, N. L., Donoghue, J. R., and Schoeps, T. L. (2001). *The NAEP 1998 technical report* (NCES 2001-509). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

[8] Data about exclusion rates are routinely published in the procedural appendices of all NAEP reports.

Average scale scores used in this report are obtained entirely from the assessed student data and their associated weights; thus, they are an estimate of the average score in the jurisdiction that would be obtained by students deemed eligible for the assessment (i.e., the assessed students and those scheduled to be assessed, but absent on the day of the testing.). NAEP uses item-response theory (IRT) scaling methods and direct estimation techniques to obtain these estimates, the description of which is beyond the scope of this report, but available in the *NAEP 1998 Technical Report*.[9] Separate IRT scalings and direct estimation procedures were used to obtain the results with and without accommodations.

The analyses described in this paper involve a number of comparisons between average scores and between percentages. The comparisons discussed in this report are based on statistical tests that consider the magnitude of the observed differences, their estimated standard errors, and the degrees of freedom associated with the estimates. The statistical tests that compare 1998 results with and without accommodations were conducted so as to reflect the dependency inherent in these two sets of estimates. (Standard errors are given in appendix D.) All statistical tests were two-tailed and were evaluated for statistical significance in two ways: 1) at the .05 level of significance, and 2) controlling for multiple comparisons using the Benjamini-Hochberg False Discovery Rate (FDR) procedure.[10] This procedure controls the expected proportion of falsely rejected hypotheses. It is the statistical comparison procedure used to report differences involving multiple comparisons in NAEP report cards. The FDR is considered more suitable for multiple comparisons in NAEP than other procedures. A detailed description of the FDR procedure appears in the *NAEP 1998 Technical Report.*

Overview of the Remaining Report

Chapter 2 presents analyses using the differential item functioning (DIF) statistical technique for examining score differences in individual test items between nonaccommodated and accommodated student groups when ability level was controlled. Chapter 3 presents the overall results in terms of average scale scores and achievement levels for the students with disabilities groups (nonaccommodated and accommodated) using the combined national and state public school sample for grades 4 and 8. Chapter 4 displays the results for the nonaccommodated and accommodated LEP students. Note that the comparisons between nonaccommodated and accommodated students in chapters 3 and 4 are made *within the special-needs groups* and do not include non-special-needs students. Chapter 5 discusses conclusions from the data analyses.

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[9] Allen, N. L., Donoghue, J. R., and Schoeps, T. L. (2001). *The NAEP 1998 technical report* (NCES 2001-509). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

[10] Benjamini, Y., and Hochberg, Y. (1994). Controlling the false discovery rate; A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society: Series B* (Statistical Methodology), no. 1, 289–300.

Chapter 2

Differential Item Functioning (DIF) Analyses

Introduction

The differential item functioning (DIF) statistical procedures compare item difficulty for two groups of test takers typically referred to as the "reference" and the "focal" groups. Statistical significance tests are provided to guide the reader's inferences about whether the differences emerging between the groups are chance occurrences. The DIF analyses are traditionally used to check on unusual differences in individual test item performance, conditioned on total score performance, among minority versus majority (reference) groups. In the process of developing valid and reliable tests, outcomes of DIF analyses may result in the reexamination and possible deletion of test questions for which statistically significant differences are detected among the focal groups. In the 1999 research report on special-needs students in NAEP, DIF analyses were employed as an aid to answering the question of whether data from nonstandard test administrations (here the subjects were mathematics and science) could be fit with the same Item Response Theory (IRT) model as data from standard administrations.[1] In that study, nonaccommodated students formed the reference group and accommodated students made up the focal group. Limitations of sample sizes of accommodated students in that study forced the combination of the students with disabilities and LEP student groups in order to have a large enough number of students to complete the analyses. For this study of the 1998 reading assessment, data from participating states and jurisdictions were combined. This aggregation created sufficient sample sizes to perform DIF analyses for the students with disabilities and LEP groups separately.

The standard NAEP DIF analysis procedures lend themselves well to these types of comparisons. In these analyses, mean performances of subgroups of students on each question in each test booklet were compared, conditional on the overall booklet score. Taking into account these score means, students in various designated focal groups were compared with students assessed under standard conditions (i.e., without accommodations), while holding constant their ability levels in reading. The Mantel-Haenszel procedure was used for dichotomously scored items (i.e., scored as correct or incorrect), while polytomously scored items (typically constructed-response items for which a response may receive partial credit) were analyzed for DIF using the Mantel statistic.[2]

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[1] Mazzeo, J., Carlson, J. E., Voelkl, K. E., & Lutkus, A. D. (1999). *Increasing the participation of special needs students in NAEP: A report on 1996 NAEP research activities* (NCES 2000-473). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

[2] Holland, P. W., and Thayer, D. T. (1988) Differential item performance and the Mantel-Haenszel procedure. In H.Wainer and H. I. Braun (Eds.), *Test validity*. Hillsdale, NJ: Earlbaum Press.

Mantel, N. (1963). Chi-square tests with one degree of freedom: Extensions of the Mantel-Haenszel procedure. *Journal of the American Statistical Association, 58,* 690-700.

Methods

In NAEP, each student is randomly assigned one of many different booklets containing different combinations of blocks of test questions (i.e., items). Thus the large pool of NAEP test questions is never seen by any individual student, and thousands of students must be tested for a given test question to attain a number of responses high enough for reliable item-level analysis. In the NAEP 1998 research design for special-needs students, this problem was addressed by selecting one test booklet at each grade level in the reading assessment for administration to all accommodated students. Hence, information was gathered about performance of all accommodated students on the questions in this booklet. If the typical NAEP design had been used, there would have been very small numbers of accommodated students responding to each item across the assessment item pool. In addition to the use of a single test booklet, larger samples were obtained for the present study by aggregating the data from all the state NAEP reading assessments. This resulted in sufficient sample sizes to permit some DIF comparisons of the performance of students with and without accommodations separately for students with disabilities and limited-English-proficient students. A disadvantage of the single accommodation booklet design is that DIF analysis can be conducted on only a portion (about one-fifth) of the items in the NAEP item pool when comparing accommodated and nonaccommodated special-needs students. It was not possible to conduct the DIF analysis on the other four-fifths of the items.

The DIF procedures resulted in a sorting of items into one of three categories: (A) little or no indication of DIF, (B) weak indication of DIF, and (C) strong indication of DIF. Generally speaking, category A contains items with no statistically significant DIF. Category B items show statistically significant DIF but relatively small effect sizes (an effect size is the actual difference standardized by dividing by the standard deviation). Many such items encountered in field tests will eventually be included in operational test forms and category B items encountered in operational test forms are rarely dropped from the scoring of the test. Category C items exhibit statistically significant DIF and relatively large effect sizes. Such items encountered in field tests are sometimes not included in operational test forms. Category C items encountered in operational test forms are reviewed by a committee of trained test developers and subject matter specialists who are charged with making judgments as to whether or not the DIF is unfairly related to group membership. Items so judged are dropped from operational tests. Note again that the DIF analysis employed in this research study is not the same as the DIF used in operational testing, which focuses on gender and race/ethnicity differential functioning. A DIF committee process was not applied to the research DIF produced for this report.

DIF Analysis Plan

As noted above, the typical focal groups of interest in DIF analyses for test development purposes are the various categories of gender and ethnicity. For the purposes of this report, a number of focal groups were defined based on the samples of students with disabilities and LEP students, as well as accommodation status. The analyses proceeded in two stages. In the first stage, differential item performance was assessed for all students with disabilities nonaccommodated students vs. all non-SD/LEP students. Similarly, differential item performance was also assessed for all LEP nonaccommodated students vs. all non-SD/LEP students. The logic was to take the largest groups, which would give the greatest statistical power to the DIF analysis procedure, check for the extent of differential performance, and then proceed based on the first set of findings. If any items in these comparisons exhibited a strong indication of DIF, then the subsequent reference groups used could not consist of combined non-SD/LEP and nonaccommodated students with disabilities or LEP students as an augmented reference group. Table 2.1 presents a summary of the results for DIF analyses carried out on the fourth-grade test questions. The first three rows in the table represent stage one of the analyses. Note that no strong indication of DIF was found for any of the 82 test questions.

Table 2.1—Summary of NAEP reading differential item functioning (DIF) analyses results, grade 4: 1998

	Focal group size	Reference group size	Total number of items	Number of items with strong indication of DIF
Grade 4				
Focal Group vs. Reference Group				
Stage 1: Analysis across item pool				
SD nonaccommodated vs. non-SD/LEP	5,449	107,655	82	0
LEP nonaccommodated vs. non-SD/LEP	2,641	107,655	82	0
SD/LEP nonaccommodated vs. non-SD/LEP	7,953	107,655	82	0
Stage 2: Analysis of items in test booklet for accommodated SD/LEP				
SD accommodated vs. SD nonaccommodated + non-SD/LEP	1,390	7,179	18	0
SD accommodated (regular sessions) vs. SD nonaccommodated + non-SD/LEP	636	7,179	18	0
SD accommodated (nonstandard sessions) vs. SD nonaccommodated + non-SD/LEP	754	7,179	18	0
LEP accommodated vs. LEP nonaccommodated + non-SD/LEP	140	6,972	18	0
LEP accommodated (regular sessions) vs. LEP nonaccommodated + non-SD/LEP	77	6,972	18	1
LEP accommodated (nonstandard sessions) vs. LEP nonaccommodated + non-SD/LEP	63	6,972	18	1

NOTE: SD = Students with disabilities

LEP= Limited-English-proficient students

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

The lack of DIF findings in the first three analyses suggest that appropriate non-SD/LEP students could be combined with nonaccommodated SD/LEP students to increase the size of the reference group in further analyses. DIF analyses, beginning with the fourth row of table 2.1, deal with accommodated students as the focal group and nonaccommodated students with disabilities or LEP students plus the non-SD/LEP students who took the same test questions as the reference group. This allowed for the largest possible reference group and the greatest statistical power to detect DIF. Note that the number of test items here and in subsequent rows is reduced to 18, (i.e., the number in the single booklet used for all accommodated (and some non-SD/LEP) students).

The six subsequent DIF analyses on students with disabilities accommodated groups, LEP accommodated, and students with disabilities in regular sessions, students with disabilities in nonstandard sessions, LEP in regular sessions, and LEP in nonstandard sessions all yielded either zero or one differentially functioning item at the strongly indicated DIF level. The students with disabilities accommodated (regular sessions) group consisted of students with disabilities who were accommodated with either a large-print test booklet or extended time. The category "SD accommodated in nonstandard sessions" was defined as the groups of students who took the assessment with other accommodations such as in small groups or in one-on-one sessions. For the fourth-grade students, only two items with DIF were detected in these comparisons.

Table 2.2 presents the findings for the eighth-grade students. The stage-one analyses indicated no DIF for the students with disabilities nonaccommodated group and revealed less than 2 percent of items with a strong indication of DIF for the LEP nonaccommodated group. The subsequent analyses revealed no DIF on items for the students with disabilities accommodated groups but a minor amount for the LEP accommodated groups. More detail on the DIF analyses is presented in appendix B, where the exact counts of items at the three DIF levels are given.

Table 2.2—Summary of NAEP reading differential item functioning (DIF) analyses results, grade 8: 1998

	Focal group size	Reference group size	Total number of items	Number of items with strong indication of DIF
Grade 8				
Focal Group vs. Reference Group				
Stage 1: Analysis across item pool				
SD nonaccommodated vs. non-SD/LEP	5,172	90,794	110	0
LEP nonaccommodated vs. non-SD/LEP	1,666	90,794	110	2
SD/LEP nonaccommodated vs. non-SD/LEP	6,715	90,794	110	0
Stage 2: Analysis of items in test booklet for accommodated SD/LEP				
SD accommodated vs. SD nonaccommodated + non-SD/LEP	1,073	4,370	20	0
SD accommodated (regular sessions) vs. SD nonaccommodated + non-SD/LEP	598	4,370	20	0
SD accommodated (nonstandard sessions) vs. SD nonaccommodated + non-SD/LEP	475	4,370	20	0
LEP accommodated vs. LEP nonaccommodated + non-SD/LEP	111	4,198	20	2
LEP accommodated (regular sessions) vs. LEP nonaccommodated + non-SD/LEP	82	4,198	20	2
LEP accommodated (nonstandard sessions) vs. LEP nonaccommodated + non-SD/LEP	29	4,198	20	1

NOTE: SD = Students with disabilities

LEP = Limited-English-proficient students

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP),1998 Reading Assessment.

Conclusion

Very few of the test questions were found to have statistically significant (differential item performance) for accommodated versus nonaccommodated special-needs students. In two cases for grade 8, where LEP accommodated groups showed statistically significant DIF results, the item performance differences were functioning in both positive and negative directions (i.e., one dichotomous item was differentially easier for the LEP accommodated students and one polytomous item was harder for them). The overall lack of DIF findings across the test questions evaluated here using the aggregated sample leads to the conclusion that the assessments are functioning in substantially the same way, from a psychometric viewpoint, for accommodated and nonaccommodated special-needs students. In the NAEP 1999 research report on inclusion of special-needs students, at two of the three grades in 1996 science, there was evidence of accommodations-related DIF.[3] In contrast, the 1996 mathematics assessment provided little, if any, evidence of accommodations-related DIF. Possible differences by subject matter and item type interaction with subject matter would indicate that DIF analyses should continue to be performed for accommodated vs. nonaccommodated special-needs students throughout all the subjects assessed by NAEP.

An additional factor, not included in the reading study, involves the availability of the bilingual booklets in certain subjects, such as mathematics in grades 4 and 8. A portion of the accommodations group in mathematics consists of native Spanish speakers who would take the test with the bilingual book. Appropriately designed accommodations and adaptations, such as the bilingual book or large-print booklets for the visually impaired, are intended to remove the possible distortion evident in scores obtained for students with disabilities and LEP students under standard testing conditions.

Subjects for which all possible accommodations cannot be made available in NAEP may create higher levels of DIF than subjects with a more complete array of accommodations. The findings of this study would also argue for the continuation of monitoring of all subjects within NAEP assessments using the DIF analysis procedure during the time when the standard method of reporting evolves to including accommodated SD/LEP groups in the NAEP report cards.

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[3] Mazzeo, J., Carlson, J. E., Voelkl, K. E., and Lutkus, A. D. (1999). *Increasing the participation of special-needs students in NAEP: A report on 1996 NAEP research activities* (NCES 2000-473). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

Chapter 3

Results for Students with Disabilities, Grades 4 and 8, Aggregate National and State Sample

Introduction

The NAEP report cards for the 2000 assessment (reading grade 4, mathematics, and science) included separate chapters in which the results for accommodated (and nonaccommodated) SD were included with those for non-special-needs students. Results for the students with SD and LEP groups were not reported separately. One reason for this is that, in the national sample, accommodated LEP students are too few in number to meet NCES reporting reliability standards. Recently passed federal legislation requires that state assessment programs report results for subgroups of their students including the SD and LEP groups.[1] This report retrospectively provides the results for these groups from the NAEP 1998 reading assessment.

The problem of small sample sizes of SD and LEP groups in the national sample was handled by combining the national public school sample with the samples from participating states, yielding a total sample size of approximately 100,000 students in each of grades 4 and 8. State NAEP does not test students in grade 12. Only the national sample at grade 12 from the 1998 report card is available. This sample is not large enough for reliable and comprehensive reporting of the SD and LEP students separately.

All NAEP analyses employ sampling weights provided by NAEP's sampling contractor (Westat) in order to make the data representative of the nation or state assessed. Percentages and average scores for the combined national and state samples addressed in this report are based on a new set of sampling weights appropriate to this sample.

A new background questionnaire was designed to collect information on SD and LEP students for the 1996 math and science assessments. A revised version of this questionnaire was used for the 1998 writing and reading assessments. A school's staff member who knew about a particular student and his/her educational experiences and/or special needs typically completed this background survey, referred to as the SD/LEP survey. The questionnaire is filled out for both assessed and absent SD and LEP students, as well as those who were excluded from the assessment. This survey contributed valuable information about the SD and LEP population. It provided NCES with information from which informed decisions could be made regarding the participation and accommodations provided for special-needs students. SD/LEP surveys are now routinely included in all NAEP's major assessments. The SD/LEP questionnaire is reproduced in appendix A.

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[1] No Child Left Behind Act of 2001, Pub. Law No. 107–110, 115 Stat. 1425 (2002).

Overall Results for Students with Disabilities, Accommodated and Nonaccommodated

Table 3.1 presents the sample size, weighted percentage of students, and average reading scale score for all students, non-SD/LEP students, and two groups of students with disabilities—the SD-only group that includes students with disabilities who were not also classified as being limited English proficient; and, the all-SD group that includes the students who were classified as SD, whether or not they were also classified as LEP. Results for both the SD-only and the all-SD groups are also reported by whether or not students received accommodations.

At both grades 4 and 8, the average scale scores for students in both SD groups were lower than those of the non-SD/LEP group. At grade 4, the difference between the nonaccommodated SD-only group and the non-SD/LEP group was 33 scale score points (217 minus 184), and the parallel difference at grade 8 was 36 scale score points (265 minus 229). To put the size of these differences into perspective, the NAEP 1998 reading report card, with its nationally representative sample, reported differences of 6 to 13 points between male and female students, and differences between race/ethnic groups similar to the differences of around 30 points reported here between the nonaccommodated and the accommodated students with disabilities.

While the apparent differences in the average scores of fourth-graders who tested with and without accommodations were not statistically significant, the differences between these groups of students with disabilities at eighth grade were statistically significant. Within both SD groups, eighth-graders who were tested with accommodations had lower average scale scores than their peers who were tested without accommodations. It is clear from these data that the accommodated students with disabilities did not benefit enough from the accommodations to score higher than nonaccommodated students with disabilities. However, the design of the present study does not provide sufficient information to offer any detailed reasons for the results. For example, it is possible that the students with disabilities who received accommodations could have had a lower distribution of scores on a pre-test compared with their nonaccommodated counterparts. The NAEP average reading score difference between the groups may have been closed substantially by the provision of accommodations, but without pretest data from both groups, this cannot be determined. In addition, the effect of accommodations on students who do not normally receive them was not assessed in this study. See Pitoniak and Royer for a review of the literature on experimental investigations of the effect of accommodations in large-scale assessments.[2]

[2] Pitoniak, M. J., and Royer, J. M. (2001). *Testing accommodations for examinees with disabilities: A review of psychometric, legal and social policy issues. Review of Educational Research, (71)*1, 53–104.

Table 3.1—Sample size, percentage of students, and average reading scores, by SD status and accommodation status, grades 4 and 8: 1998

	Number of students	Weighted percentage	Average score
Grade 4			
Total students	104,491	100	213
Non-SD/LEP	99,024	89	217 †
SD-only	3,852	7	181
Nonaccommodated	2,318	4	184
Accommodated	1,534	3	177
All-SD	3,951	7	180
Nonaccommodated	2,381	4	183
Accommodated	1,570	3	176
Grade 8			
Total students	95,460	100	261
Non-SD/LEP	90,424	90	265 †
SD-only	3,784	7	225
Nonaccommodated	2,551	4	229 *
Accommodated	1,233	3	218
All-SD	3,915	7	224
Nonaccommodated	2,650	5	228 *
Accommodated	1,265	3	218

NOTE: SD = Students with disabilities
LEP = Limited-English-proficient students
Subgroup percentages do not sum to 100 because LEP students percentages are not included in table.
† The non-SD/LEP group is significantly different from the SD-only and all-SD groups.
* Nonaccommodated group is significantly different from the accommodated group.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

The similarity of the size of the score difference between the SD-only vs. non-SD/LEP groups and the size of the score differences between ethnic groups suggests an examination of the ethnic distributions of the SD and non-SD/LEP samples. Table 3.2 presents the percentage of students in each ethnic group. There is little apparent difference in the ethnic distributions of the non-SD/LEP and the SD-only group in either grade. This suggests that imbalance in the proportions of ethnic groups represented among students with disabilities is not an adequate explanation for lower performance compared to non-SD/LEP students.

Table 3.2—Percentage of students in NAEP reading assessment identified as non-SD/LEP and SD-only, by race/ethnicity and accommodation status, grades 4 and 8: 1998

	White	Black	Hispanic	Asian/ Pacific Islander	American Indian
Grade 4					
Non-SD/LEP	63	16	14	4 †	2 †
SD-only	64	14	17	2	4
Nonaccommodated	62	13	19	2	4
Accommodated	65	15	13	2	5
Grade 8					
Non-SD/LEP	66	15	13 †	4 †	2
SD-only	65	14	17	1	3
Nonaccommodated	66	15	16	2 *	2
Accommodated	65	14	18	1	3

NOTE: SD = Students with disabilities
LEP = Limited-English-proficient students
† The non-SD/LEP group is significantly different from the SD-only group.
* Nonaccommodated group is significantly different from the accommodated group.
Percentages may not add to 100 due to rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Another question is whether there are differences in the percentages of students with disabilities within each racial/ethnic subgroup. Table 3.3 displays the percentage of students in each racial/ethnic subgroup that were classified as SD-only. At both grades 4 and 8 the percentages of White, Black, and Hispanic students that are classified as SD are remarkably consistent at 6 to 7 percent. The apparently higher percentages (11 to 13 percent) of American Indian students are classified as SD were not found to be statistically significant. The apparently lower percentages (2 to 3 percent) of Asian/Pacific Islander students classified as SD were not found to be statistically significant.

Table 3.3—Percentage of racial/ethnic student subgroups in NAEP reading assessment identified as SD-only by accommodation status, grades 4 and 8: 1998

	White	Black	Hispanic	Asian/ Pacific Islander	American Indian
Grade 4					
SD-only	7	6	6	3	13
Nonaccommodated	4	3	4	2	6
Accommodated	3	3	2	1	7
Grade 8					
SD-only	7	7	7	2	11
Nonaccommodated	4	4	4	2	6
Accommodated	3	2	3	#	5

NOTE: SD = Students with disabilities

Percentage is between .0 and .5.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Achievement Levels, Accommodated and Nonaccommodated

Table 3.4 presents the percentage of the non-SD/LEP and students with disabilities tested with and without accommodations at or above the reading achievement levels for grades 4 and 8. The achievement levels are performance standards defined for NAEP by the National Assessment Governing Board (NAGB) based on the collective judgments of experts about what students should know and be able to do in terms of the NAEP subject frameworks. The three levels are *Basic*, *Proficient,* and *Advanced*. Student performance in terms of percentages within these levels, as well as at or above *Basic* and at or above *Proficient*, is displayed in the NAEP report cards. The NAEP legislation requires that achievement levels "be used on a trial basis until the Commissioner (of Education Statistics) determines . . . that such levels are reasonable, valid, and informative to the public."[3]

For the purpose of this report, data for selected NAEP reading achievement levels (at or above *Basic*, at or above *Proficient,* and at *Advanced*) are provided in table 3.4 for the non-SD/LEP and the accommodated and nonaccommodated SD-only students. At both grades, the non-SD/LEP students had higher percentages at or above *Basic* and at or above *Proficient* than the SD-only students. While nearly two-thirds of non-SD/LEP students were at or above *Basic* at grade 4, less than one-third of the SD-only students were at or above *Basic*.

Within the SD-only group at grade 8, accommodated students had lower percentages at or above the *Basic* and *Proficient* achievement levels than the nonaccommodated students. The apparent differences at grade 4 were not statistically significant.

[3] No Child Left Behind Act of 2001, Pub. Law No. 107–110, 115 Stat. 1425 (2002).

Table 3.4—Percentage of students identified as non-SD/LEP and SD-only at or above reading achievement levels, by accommodation status, grades 4 and 8: 1998

	At or above *Basic*	At or above *Proficient*	At *Advanced*
Grade 4			
Non-SD/LEP	63 †	30 †	6
SD-only	27	8	1
Nonaccommodated	29	10	1
Accommodated	26	6	1
Grade 8			
Non-SD/LEP	77 †	32 †	2
SD-only	32	5	#
Nonaccommodated	37 *	6 *	#
Accommodated	23	3	#

NOTE: SD = Students with disabilities
LEP = Limited-English-proficient students
† The non-SD/LEP group is significantly different from the SD-only group.
* Nonaccommodated group is significantly different from the accommodated group.
# Percentage is between .0 and .5.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Gender

Table 3.5 presents the percentages and average scale scores of male and female students for the non-SD/LEP and the SD-only groups. For the non-SD/LEP students in the aggregate sample, the percentages of male and female students are nearly equal. However, in the groups of students who were identified as having disabilities, male students represent about two-thirds of the sample in both grades 4 and 8.

As noted in the 1998 reading report card, female students have higher reading scores than male students in both grades.[4] This score difference holds for the non-SD/LEP group at both grades 4 and 8, and the SD-only group at grade 8. The apparent difference in average reading scale scores between male and female students with disabilities at grade 4 was not statistically significant.

Among the students with disabilities, the nonaccommodated group had higher average scores than the group receiving accommodations for both male and female students at grade 8. At grade 4, however, the apparent differences were not statistically significant.

[4] Donahue, P. L., Voelkl, K. R., Campbell, J. R., and Mazzeo, J. (1999). *The NAEP 1998 reading report card for the nation and the states* (NCES 1999-500). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

Table 3.5—Percentage of students identified as non-SD/LEP and SD-only, and average reading scores, by gender and accommodation status, grades 4 and 8: 1998

	Male	Female
Grade 4		
Non-SD/LEP		
Weighted percentage	49	51
Average score	215 †	220 †
SD-only		
Weighted percentage	67	33
Average score	180	183
Nonaccommodated		
Weighted percentage	67	33
Average score	183	185
Accommodated		
Weighted percentage	67	33
Average score	175	180
Grade 8		
Non-SD/LEP		
Weighted percentage	49	51
Average score	260 †	271 †
SD-only		
Weighted percentage	67	33
Average score	223	229
Nonaccommodated		
Weighted percentage	66	34
Average score	226 *	235 *
Accommodated		
Weighted percentage	69	31
Average score	219	218

NOTE: SD = Students with disabilities
LEP = Limited-English-proficient students
† The non-SD/LEP group is significantly different from the SD-only group.
* Nonaccommodated group is significantly different from the accommodated group.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Type of Disability

Table 3.6 presents the percentages of students with disabilities and their average reading scale scores by type of disability. Many of the detailed categories of disability in the SD/LEP questionnaire represented very small percentages of students, even when starting with a total sample size of approximately 100,000 students. Therefore, table 3.6 presents combined categories, such as hearing, speech, and visual impairment. The complete list of categories can be seen in the SD/LEP questionnaire in appendix A. The percentage entries in the table refer to the percentage of the SD group. The Learning-Disabled category comprised one-half of the total SD group at grade 4, and 62 percent at grade 8. Students with Hearing, Speech, or Visual impairments represented 10 percent of the group at the fourth grade, but 3 percent at eighth grade. Students in the Mental Cognitive, Emotional, Multiple and Other category represented 18 percent of the students with disabilities at fourth grade and 13 percent at eighth grade. At both fourth and eighth grades, about one-fifth of the SD group did not have disability category information available from the questionnaire.

At grade 4, none of the apparent differences in average reading scale scores between students with disabilities with varying types of disabilities were statistically significant. At grade 8, students with hearing, speech, and visual impairments had higher average scale scores than students with learning disabilities and/or mental cognitive, emotional, and multiple disabilities.

Eighth-grade students with disabilities who tested without accommodations had higher scores than students testing with accommodations in the learning disabled, and combined mental cognitive, emotional, multiple, and other categories. As mentioned earlier, the absence of a true experimental design in this study precludes speculation about the causes for the lower score distributions of the accommodated students.

Table 3.6—Percentage of students identified as SD-only, and average reading scores, by disability type and accommodation status, grades 4 and 8: 1998

	Disablility Type			
	Learning disabled	Hearing, speech, or visual	Mental cognitive, emotional, multiple, other	Information not available
Grade 4				
SD-only				
Weighted percentage	50	10	18	22
Average score	178	197	175	185
Nonaccommodated				
Weighted percentage	47	15	17	21
Average score	180	198	177	187
Accommodated				
Weighted percentage	55	4	18	23
Average score	176	186	171	182
Grade 8				
SD-only				
Weighted percentage	62	3	13	23
Average score	226	245	218	225
Nonaccommodated				
Weighted percentage	64	4	13	19
Average score	228 *	249	224 *	233 *
Accommodated				
Weighted percentage	58	1	11	30
Average score	221	***	207	217

NOTE: SD = Students with disabilities

* Nonaccommodated group is significantly different from the accommodated group.

*** Sample size is insufficient to permit a reliable estimate.

Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Severity of Disability

The SD/LEP questionnaire gathered information about the severity of the disability of each special-needs student. The individual from the school who completed the questionnaire indicated whether the disability was profound, severe, moderate, or mild. Table 3.7a combines the low-frequency categories of profound and severe disabilities. Students estimated to have mild disability comprised 46 percent of the SD group at grade 4, and 47 percent at grade 8. About one-half of the students with disabilities who were tested without accommodations in both grades 4 and 8 were identified as mildly disabled. Students estimated to have moderate disability levels made up 32 percent of the fourth-grade group and 28 percent of the eighth-grade group. Only a small percentage of students at both grades were estimated to have profound or severe disabilities. Note that the NAEP school samples include only regular schools, not institutions that specialize in enrolling disabled students.

The results presented in table 3.7a for the SD groups at grades 4 and 8 show higher average scale scores for students identified as having mild disabilities than those identified as having moderate or profound disabilities. In addition, eighth-graders with moderate disabilities scored higher, on average, than those with profound disabilities. At grade 4, there were no statistically significant differences in the average scale scores of students tested with or without accommodations by severity of disability. At grade 8, students with moderate disabilities who were tested without accommodations had higher average scale scores than those tested with accommodations.

Table 3.7a—Percentage of students identified as SD-only, and average reading scores, by estimated degree of students' disability and accommodation status, grades 4 and 8: 1998

	Mild	Moderate	Profound/ severe	Information not available
Grade 4				
SD-only				
Weighted percentage	46	32	7	16
Average score	187	172	170	184
Nonaccommodated				
Weighted percentage	50	28	6	15
Average score	191	172	168	188
Accommodated				
Weighted percentage	40	36	8	17
Average score	181	172	172	179
Grade 8				
SD-only				
Weighted percentage	47	28	6	19
Average score	231	222	207	221
Nonaccommodated				
Weighted percentage	51	29	5	15
Average score	234	226 *	206	229 *
Accommodated				
Weighted percentage	42	27	6	26
Average score	224	216	210	214

NOTE: SD = Students with disabilities

* Nonaccommodated group is significantly different from the accommodated group.

Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Performance of Learning Disabled (LD) Group by Severity of Disability

Because the learning disabled (LD) category made up such a large proportion of the students with disabilities group, the sample size was large enough to examine selected subgroups within the LD group. Table 3.7b displays the percentage of LD students and average scale scores by degree of disability. The categories of profound and severe, which occurred with low frequency, are combined. Students estimated to have mild disability made up more than half of the LD group at both grades 4 and 8.

Similar to the results presented for the students with disabilities group overall, LD students identified as having mild disabilities had higher average scale scores than those identified as having moderate or profound/severe disabilities at both grades 4 and 8. Eighth-graders with moderate disabilities scored higher on average than those with profound/severe disabilities.

Within the LD group at grade 8, the students who tested without accommodations had a higher average scale score (228) than the students who tested with accommodations (221), a finding which parallels the result for the SD group in general (data not displayed in table).

In table 3.7b there were no statistically significant differences among the groups with different degrees of disability by accommodation status at either grade 4 or grade 8.

Table 3.7b—Percentage of students identified as LD-only, and average reading scores, by estimated degree of students' disability and accommodation status, grades 4 and 8: 1998

	Mild	Moderate	Profound/ severe	Information not available
Grade 4				
LD-only				
Weighted percentage	55	39	5	1
Average score	185	169	159	***
Nonaccommodated				
Weighted percentage	61	34	4	1
Average score	187	167	***	***
Accommodated				
Weighted percentage	49	44	6	1
Average score	182	171	***	***
Grade 8				
LD-only				
Weighted percentage	62	31	5	2
Average score	230	221	199	***
Nonaccommodated				
Weighted percentage	64	29	5	2
Average score	231	224	199	***
Accommodated				
Weighted percentage	58	35	6	1
Average score	226	215	***	***

NOTE: LD = Learning disabled students

*** Sample size is insufficient to permit a reliable estimate.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Learning Disabled Students by Gender

As shown in table 3.8, 70 percent of the LD fourth-graders and 67 percent of LD eighth-graders are male. In contrast, male students made up 49 percent of the non-SD/LEP group at both grades (table 3.4). Within the LD category, nonaccommodated female students at grade 8 had higher average scale scores than male students, a pattern similar to that for non-SD/LEP students. The apparent higher scores for females at grade 4 did not reach statistical significance in the LD group.

Table 3.8—Percentage of students identified as LD-only, and average reading scores, by gender and accommodation status, grades 4 and 8: 1998

	Male	Female
Grade 4		
LD-only		
Weighted percentage	70	30
Average score	176	181
Nonaccommodated		
Weighted percentage	69	31
Average score	177	182
Accommodated		
Weighted percentage	71	29
Average score	174	180
Grade 8		
LD-only		
Weighted percentage	67	33
Average score	222	232
Nonaccommodated		
Weighted percentage	64	36
Average score	223	236 *
Accommodated		
Weighted percentage	71	29
Average score	220	223

NOTE: LD = Learning disabled students

* Nonaccommodated group is significantly different from the accommodated group.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Performance of Students with Disabilities by Accommodation Type

Table 3.9 presents the percentage of students with disabilities tested with accommodations and average reading scale scores by the type of accommodation they received. It should be noted that students assessed with accommodations typically received some combination of them. For example, students assessed in small groups (as compared to standard NAEP sessions of about 30 students) usually received extended time. In one-on-one administrations, students often received assistance in recording answers and were afforded extra time. Extended time was classified as the primary accommodation only when it was the sole accommodation provided. In addition, NAEP did not allow some accommodations that were permitted in certain states in their local assessments. Some states have allowed questions, and in some cases, reading passages to be read aloud to the students. In designing the reading assessment, NAEP considered reading aloud to be an accommodation that changed the nature of the construct being measured and, hence, was not permitted. Because NAEP considers the domain of its reading assessment to be reading in English, no attempt was made to provide an alternate-language version of the assessment; the use of bilingual dictionaries was not permitted.

As shown in table 3.9, extended-time and small-group testing were the accommodations received most frequently by the students in both grades 4 and 8. There were no statistically significant differences in average scale scores in either grade by accommodation type, where samples were large enough to carry out the significance tests.

Table 3.9—Percentage of students identified as SD-only, and average reading scores, by accommodation type, grades 4 and 8: 1998

	Large print test book	Extended time	Small group	One-on-one testing	Scribe/ computer	Other
Grade 4						
SD-only						
Weighted percentage	1	44	46	5	3	1
Average score	***	180	171	182	203	***
Grade 8						
SD-only						
Weighted percentage	5	53	38	2	1	1
Average score	***	218	218	***	***	***

NOTE: SD = Students with disabilities

*** Sample size is insufficient to permit a reliable estimate.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Chapter 4

Results for Limited-English-Proficient Students, Grades 4 and 8, Aggregate National and State Sample

Introduction

As noted in the previous chapter, this report represents the first time that NAEP has published the performance of students with disabilities and LEP students separately from the results for non-SD/LEP students. The problem of small sample sizes was handled by combining all state NAEP data with the national public school sample to create a new aggregate sample, with its own sampling weights. The results reported here are calculated with the special, aggregate sampling weights (previously discussed on page 10).

Overall Results for Limited-English-Proficient (LEP) Students, Accommodated and Nonaccommodated

Table 4.1 presents the sample size, weighted percentage, and average scale scores for the total sample, non-SD/LEP students and LEP-only students. Data are also presented for LEP students who tested with and without accommodations. The LEP-only group includes limited-English-proficient students who were not also classified as having a disability. The all-LEP group includes the students who were classified as LEP whether or not they were also classified as students with disabilities. The all-LEP group represented 4 percent of the total students assessed in the fourth grade and 3 percent of those assessed in the eighth grade. In contrast, the all students with disabilities group reported in the previous chapter was approximately twice as large, representing 7 percent of the total assessed students at both grades 4 and 8. At both grades 4 and 8, the non-SD/LEP students had higher average scale scores than the LEP-only and the all-LEP groups.

The average scale score point differences between non-SD/LEP students and LEP only students (43 points at grade 4 and 41 points at grade 8) should be put in context with the 33–36 average score point differences between the non-SD/LEP students and the students with disabilities only mentioned previously. Again, the order of magnitude of these differences is comparable to the differences between White and Black or Hispanic students on the same reading scale.

The apparent pattern observed previously in the students with disabilities—that of nonaccommodated students generally having higher scores than accommodated students—seems to appear as well in the LEP data. However, only one of the apparent differences between nonaccommodated and accommodated groups, the difference between the all-LEP groups at grade 8 (224 versus 202), reached statistical significance.

Table 4.1—Sample size, percentage of students, and average reading scores, by LEP status and accommodation status, grades 4 and 8: 1998

	Number of students	Weighted percentage	Average score
Grade 4			
Total students	104,491	100	213
Non-SD/LEP	99,024	89	217 †
LEP-only	1,516	4	174
Nonaccommodated	1,358	4	175
Accommodated	158	#	171 !
All-LEP	1,615	4	173
Nonaccommodated	1,421	4	174
Accommodated	194	#	167 !
Grade 8			
Total students	95,460	100	261
Non-SD/LEP	90,424	90	265 †
LEP-only	1,121	3	224
Nonaccommodated	1,009	3	226
Accommodated	112	#	203 !
All-LEP	1,252	3	222
Nonaccommodated	1,108	3	224 *
Accommodated	144	#	202

NOTE: SD = Students with disabilities
LEP = Limited-English-proficient students
† The non-SD/LEP group is significantly different from the LEP-only and all-LEP groups.
# Percentage is between .0 and .5.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
* Nonaccommodated group is significantly different from the accommodated group.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

LEP Sample Percentage Distribution by Region

As shown in table 4.2, students with disabilities are fairly evenly distributed across NAEP's four geographic regions, while LEP students at both grades 4 and 8 are concentrated in the western region of the country. Seventy-nine to 81 percent of the LEP students came from states in the western region. The definition of the western region for NAEP includes the states of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oklahoma, Oregon, Texas, Utah, Washington, and Wyoming. These states have relatively high percentages of Asian/Pacific Islander, Hispanic, and Native American students whose first language is not English.

Table 4.2—Percentage of students in NAEP reading assessment identified as SD-only and LEP-only, by region of U.S., grades 4 and 8: 1998

	Northeast	Southeast	Central	West
Grade 4				
SD-only	22	28	23	28
LEP-only	7	7	6	81
Grade 8				
SD-only	21	26	22	30
LEP-only	8	7	6	79

NOTE: SD = Students with disabilities
LEP = Limited-English-proficient students
Percentages may not add to 100 due to rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Achievement Levels, Accommodated and Nonaccommodated

As noted in chapter 3, the three achievement levels (*Basic, Proficient,* and *Advanced*) are performance standards defined for NAEP by the National Assessment Governing Board (NAGB) based on the collective judgments about what students should be expected to know and be able to do in terms of the NAEP subject frameworks. For the purpose of this report, data for NAEP reading achievement levels (at or above *Basic,* at or above *Proficient,* and at *Advanced*) are provided in table 4.3 for the non-SD/LEP students, and the accommodated and nonaccommodated LEP students. At both grades, the non-SD/LEP students had higher percentages than the LEP groups at or above the *Basic* and *Proficient* levels. The percentage of fourth-graders at *Advanced* was also higher for non-SD/LEP students than for LEP-only students.

Within the LEP-only group, the apparent differences between achievement level percentages for students with and without accommodations were not statistically significant.

Table 4.3—Percentage of students identified as non-SD/LEP and LEP-only at or above reading achievement levels, by accommodation status, grades 4 and 8: 1998

	At or above *Basic*	At or above *Proficient*	At *Advanced*
Grade 4			
Non-SD/LEP	63 †	30 †	6 †
LEP-only	19	5	1
Nonaccommodated	19	5	#
Accommodated	19 !	5 !	1
Grade 8			
Non-SD/LEP	77 †	32 †	2
LEP-only	30	3	#
Nonaccommodated	31	3	#
Accommodated	17 !	2	0

NOTE: SD = Students with disabilities
LEP = Limited-English-proficient students
† Non-SD/LEP group is significantly different from the LEP-only group.
# Percentage is between .0 and .5.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Gender

Table 4.4 presents the percentages and average scale scores for male and female students in the non-SD/LEP and the LEP-only groups. For the non-SD/LEP students in the aggregate sample, the percentages of male and female students are nearly equal. This is also true for the LEP group that did not receive accommodations. However, the LEP group that did receive accommodations at grade 8 was predominantly male (81 percent). While there is a statistically significant difference in percentages between the accommodated and nonaccommodated groups, the small sample size (112 out of more than 90,000 students) of accommodated LEP students at grade 8 suggests caution in drawing any conclusions about this difference. It should also be noted that, in NAEP subjects other than reading, translations of test books in Spanish are made available to LEP students who normally have this accommodation. The provision of this accommodation would radically change the proportion of accommodated LEP students in other NAEP subjects compared with those found in reading.

The apparent average scale score differences in favor of females over males in the LEP-only group and differences between the nonaccommodated and the accommodated groups were in the same direction as seen in the students with disabilites group, but none reached statistical significance in the LEP student groups.

Non-SD/LEP male and female students at both grades 4 and 8 had higher scores than LEP-only male and female students, respectively. Similarly, non-SD/LEP male and female students at both grades scored higher than their counterparts in the SD-only group.

Table 4.4—Percentage of students identified as non-SD/LEP and LEP-only, and average reading scores, by gender and accommodation status, grades 4 and 8: 1998

	Male	Female
Grade 4		
Non-SD/LEP		
Weighted percentage	49	51
Average score	215 †	220 †
LEP-only		
Weighted percentage	48	52
Average score	172	176
Nonaccommodated		
Weighted percentage	49	51
Average score	172	177
Accommodated		
Weighted percentage	41	59
Average score	174	168
Grade 8		
Non-SD/LEP		
Weighted percentage	49	51
Average score	260 †	271 †
LEP-only		
Weighted percentage	53	47
Average score	222	226
Nonaccommodated		
Weighted percentage	51	49
Average score	225	226
Accommodated		
Weighted percentage	81	19
Average score	202	***

NOTE: SD = Students with disabilities
LEP = Limited-English-proficient students
† The non-SD/LEP group is significantly different from the LEP-only group.
*** Sample size is insufficient to permit a reliable estimate.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Performance by Years Receiving Instruction in English, Accommodated and Nonaccommodated

Tables 4.5a and 4.5b present data on the percentage of students and average scale scores by the number of years LEP students received instruction in English for grades 4 and 8, respectively. The tables also display the same data by the number of years students received instruction specifically designed for limited-English-proficient students. At grade 4 (table 4.5a) there was

no pattern of significant differences in average NAEP scores either by the number of years of instruction received in English, or by the number of years of instruction in a program designed for LEP students. It should be noted that information on the number of years of instruction was not available for about one-third of the nonaccommodated group and nearly two-thirds of the accommodated group. Further, the total sample size for the accommodated LEP-only group was 158, which made statistical significance testing of subgroups nonproductive.

Table 4.5a—Percentage of students identified as LEP-only, and average reading scores, by years receiving instruction in English or instruction designed for LEP students, grade 4: 1998

	Years of instruction					
	None	One	Two	Three	Four or more	Information not available
Grade 4						
LEP-only						
Instruction in English						
Weighted percentage	6	10	7	7	33	37
Average score	***	180	169	172	180	172
Nonaccommodated						
Weighted percentage	6	11	7	7	34	34
Average score	***	180	168	171	179	174
Accommodated						
Weighted percentage	1	4	7	6	20	63
Average score	***	***	***	179	***	162
Instruction designed for LEP students						
Weighted percentage	4	5	7	10	34	40
Average score	190	173	179	174	171	175
Nonaccommodated						
Weighted percentage	4	5	7	10	36	37
Average score	187	172	180	174	170	177
Accommodated						
Weighted percentage	6	2	4	5	20	63
Average score	***	***	***	***	***	162

NOTE: LEP = Limited-English-proficient students

*** Sample size is insufficient to permit a reliable estimate.

Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

At grade 8, LEP students who had four or more years of instruction in English scored higher, on average, than those who had two years of instruction in English (see table 4.5b). LEP eighth-graders who had no years of English instruction designed for LEP students had higher scores than those who had two years or more of instruction in English designed for LEP

students. This seemingly paradoxical finding may be accounted for by placement practices within the schools. Students classified as LEP whose English skills appear fairly good are likely not to be placed into English instruction designed for LEP students, but, rather, into regular English classes.

Small sample size hampered statistical significance testing of the performance of students assessed with and without accommodations at grade 8. The accommodated LEP-only group had a total size of only 112 students, making the number of students in each response category too small to permit a reliable estimate of the average score. In addition, information was reported as not available for 32 to 43 percent of the student groups, making interpretation of the years-of-instruction variable problematic.

Table 4.5b—Percentage of students identified as LEP-only, and average reading scores, by years receiving instruction in English or instruction designed for LEP students, grade 8: 1998

	Years of instruction					
	None	One	Two	Three	Four or more	Information not available
Grade 8						
LEP-only						
Instruction in English						
Weighted percentage	1	3	8	8	38	42
Average score	***	***	210	222	230	224
Nonaccommodated						
Weighted percentage	1	2	7	8	39	43
Average score	***	***	214	222	230	226
Accommodated						
Weighted percentage	3	16	15	3	32	32
Average score	***	***	***	***	***	***
Instruction designed for LEP students						
Weighted percentage	12	3	8	8	28	41
Average score	238	***	203	223	225	224
Nonaccommodated						
Weighted percentage	12	3	7	8	29	41
Average score	238	***	210	224	226	226
Accommodated						
Weighted percentage	7	9	21	15	10	37
Average score	***	***	***	***	***	***

NOTE: LEP = Limited-English-proficient students

*** Sample size is insufficient to permit a reliable estimate

Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Performance Language Judged by School as Student's Best

School personnel were asked in the SD/LEP questionnaire to estimate, for each LEP student, the language in which he or she could best demonstrate reading ability. The choices in the questionnaire were English, Spanish, other, and unknown. Table 4.6 presents the percentages of LEP students and the average scale scores for these categories for grades 4 and 8.

Although the average scale scores for students estimated to perform best in reading in Spanish appear lower than the other language categories, these apparent differences did not reach statistical significance. As with several of the previous tables, information for one- to two-thirds of the LEP students was not available. This limitation, along with the small sample size for the accommodated LEP groups, prevents drawing conclusions from these data.

Table 4.6—Percentage of students identified as LEP-only, and average reading scores, by language in which students are believed to best demonstrate reading ability, grades 4 and 8: 1998

	English	Spanish	Other	Information not available
Grade 4				
LEP-only				
Weighted percentage	52	12	1	34
Average score	179	160	***	171
Nonaccommodated				
Weighted percentage	55	13	1	31
Average score	179	159	***	173
Accommodated				
Weighted percentage	23	8	1	67
Average score	***	***	***	164
Grade 8				
LEP-only				
Weighted percentage	41	12	4	43
Average score	228	214	***	224
Nonaccommodated				
Weighted percentage	42	11	4	43
Average score	228	216	***	226
Accommodated				
Weighted percentage	33	19	5	43
Average score	***	***	***	***

NOTE: LEP = Limited-English-proficient students

*** Sample size is insufficient to permit a reliable estimate.

Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Performance by Accommodation Type

As shown in table 4.7, the most frequent accommodation for LEP students who did not have a disability was the provision of extended time to complete the assessment. Sixty-two percent of LEP fourth-graders and 87 percent of LEP eighth-graders who received an accommodation were in this category. The next accommodation most frequently provided was testing in small groups (36 percent at fourth-grade and 8 percent at eighth-grade).

Approximately 10 percent of LEP-only students at grades 4 and 8 were tested with an accommodation. The sample sizes for table 4.7 are, therefore, quite small. There were a total of 158 LEP students at grade 4 and 112 LEP students at grade 8 who received accommodations.

The small samples in the accommodation categories other than extended time meant that the average scale scores in these categories were not sufficiently reliable to perform statistical significance testing. The question of the effect of different accommodation types on the performance of LEP students may be examined in other NAEP subjects where a Spanish translation test book was made available to accommodated students.

Table 4.7—Percentage of students identified as LEP-only, and average reading scores, by accommodation type, grades 4 and 8: 1998

	Large print test book	Extended time	Small group	One-on-one testing	Scribe/ computer	Other
Grade 4						
LEP-only						
Weighted percentage	#	62	36	1	#	1
Average score	***	171	***	***	***	***
Grade 8						
LEP-only						
Weighted percentage	3	87	8	2	0	0
Average score	***	202	***	***	0	0

NOTE: LEP = Limited-English-proficient students

*** Sample size is insufficient to permit a reliable estimate.

Percentage is between .0 and .5.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Chapter 5

Conclusion

As noted in chapter 1, the two purposes of this report were to apply differential item functioning (DIF) analyses to the NAEP test questions taken by special-needs students, and to display NAEP reading performance data for students with disabilities and LEP students separately, using the aggregated national public school and state samples. The DIF analyses covered both multiple-choice and constructed-response questions that were administered in a common booklet to all special-needs students and to a proportion of non-SD/LEP students. The DIF analyses were employed in a somewhat nontraditional manner in that the focal and reference groups of interest here were the accommodated and nonaccommodated (within SD and within LEP) groups, respectively. The traditional use of DIF would have been to make comparisons of item performance between majority and minority groups, or majority and SD/LEP groups. The purpose here, however, was to assess, to the extent possible with this statistical tool, the relative invariance of NAEP item construct validity for the nonaccommodated and accommodated special-needs students. In other words, did the various NAEP assessment questions appear to measure the same thing for accommodated students compared with nonaccommodated special-needs students? This was an important issue to address because NAEP plans to report on all accommodated special-needs students, and item construct invariance must be assumed to hold for this reporting convention to be acceptable.

DIF Results

Very few of the test questions were found to have statistically significant differential item performance for accommodated versus nonaccommodated special-needs students. In two cases at grade 8 where the LEP-accommodated groups showed statistically significant DIF results, the advantages were in both positive and negative directions (i.e., one item was differentially easier for the LEP-accommodated students and one item was harder for them). The overall lack of DIF findings over the aggregated sample leads to the conclusion that providing accommodations for both students with disabilities and LEP students will have no major effect on the reported aggregate results. There is one important qualifier to this conclusion, however. Since NAEP reading assessments do not permit Spanish translation test booklets, the conclusion may not generalize to other NAEP subjects, where LEP students may receive translated booklets or use linguistic accommodations such as glossaries or bilingual dictionaries.

SD and LEP Results

The overall average NAEP scale scores for students with disabilities were below those of non-SD/LEP students. The magnitude of the difference (approximately 33 to 36 scale score points on NAEP's 500 point scale) between non-SD/LEP students and students with disabilities tested without accommodations was comparable to the difference between White and Black students or between White and Hispanic students as reported in the NAEP 1998 reading report card.

The race/ethnicity distribution of students with disabilities did not appear to differ from that of non-SD/LEP students. The performance of LEP students was also significantly below that of non-SD/LEP students in the same grade. The average scale score point differences between non-SD/LEP students and LEP-only students was 43 points at grade 4 and 41 points at grade 8.

Within both students with disabilities and LEP groups, the nonaccommodated students appeared to have higher average scale scores than the accommodated students at grades 4 and 8, but the differences reached statistical significance only at grade 8. Within the SD, at grade 8, students with learning disabilities and students in the combined disability categories of mental cognitive, emotional, multiple, and other disabilities also displayed the pattern in which nonaccommodated students had higher scale scores than accommodated students.

The learning-disabled student category made up one-half of the SD group at grade 4 and 62 percent of the group at grade 8. Students categorized as learning disabled were predominantly male (70 and 67 percent at grades 4 and 8, respectively). Within the learning-disabled student category, female students had higher scores than males at grade 8, while the apparent difference at grade 4 was not statistically significant. In addition, while male students with learning disabilities did not show statistically significant scale score differences between accommodated and nonaccommodated students at either grade, there was a statistically significant difference among female students with learning disabilities in favor of the nonaccommodated group at grade 8.

For both SD and LEP groups, extended time was the most common accommodation among the students who received accommodations. Testing in small group settings was the next most frequent accommodation. There were no statistically significant average scale score differences by accommodation type for either SD or LEP groups in either grade where sample sizes were large enough to carry out statistical significance testing. The fact that the NAEP reading assessment did not permit a Spanish translation test booklet as an accommodation constrains the conclusions in this report to the reading subject area. The absence of a statistically significant score difference by accommodation type for LEP students in reading may not generalize to, for example, mathematics, where a Spanish booklet is available. Additional research will therefore be needed to check for score differences by accommodation type in other NAEP subjects.

The number of years receiving instruction in English and the number of years receiving instruction in English as specifically designed for LEP students were recorded from the SD/LEP questionnaire. There was no pattern of statistically significant differences in average NAEP reading scores associated with either measure of instruction in English at grade 4**.** However, at grade 8, LEP students who received four-or-more years of instruction in English scored higher, on average, than those who had two years of instruction. Eighth-graders who were LEP and did not take English instruction specifically designed for LEP students had higher reading scores than LEP eighth-graders who took such courses for two or more years.

Neither the findings from the DIF analyses nor the results from the SD analyses of the nonaccommodated versus accommodated and LEP students suggest any reasons why the data from accommodated special-needs students should not be included and reported on in future NAEP reading assessments.

Appendix A

SD/LEP Questionnaire

SD/LEP STUDENT QUESTIONNAIRE

POSITION OF PERSON
COMPLETING QUESTIONNAIRE

Ⓐ Principal/Assistant Principal

Ⓑ Special Education Teacher

Ⓒ Bilingual Education/ESL Teacher

Ⓓ Classroom Teacher

Ⓔ Other (specify) _____

A representative sample of students across the country, including some students in your school, have been selected to take part in the National Assessment of Educational Progress (NAEP). The current assessment focuses on civics, reading, and writing. As part of the assessment, NAEP will investigate the relationship between students' achievement and various school, teacher, and home factors that may influence this achievement. In order to obtain a complete picture of how **all** students are doing, it is important to collect information on **all** students who have been identified as having a disability or limited English proficiency, whether they will be assessed or NOT.[1] We are asking you to complete this questionnaire about one of those students.

We realize you are very busy; however, we urge you to complete this questionnaire as carefully as possible. The information you provide will be kept confidential.

NAEP is authorized under Public Law 103-382. While your participation is voluntary, your responses to these questions are needed to make this survey accurate and complete.

Please complete questions 1 and 2 first. Answer directly on the questionnaire with a number 2 pencil by gridding the appropriate letter, and if necessary, writing your response in the space provided. When you are finished, please return the questionnaire to your school's NAEP coordinator.

Thank you very much for your help.

1. Does this student have a disability (physical and/or mental)?

   Ⓐ No

   Ⓑ Yes (Please complete SECTION A, beginning with question 3 on page 3.

2. Does this student have limited English proficiency (LEP)?

   Ⓐ No

   Ⓑ Yes (Please complete SECTION B, beginning with question 20 on page 8.

If the student has both a disability and limited English proficiency, please complete SECTIONS A and B.

[1] For the purposes of this questionnaire, students with a disability include those who have an IEP or equivalent classification, such as those identified as part of the 504 program.

SECTION A: STUDENTS WITH DISABILITIES

Complete this section for all students with a disability who have an IEP or equivalent classification.

3. Which of the following best describes this student's disability? **(Grid in all that apply.)**

Ⓐ Learning disability	ID100250	Ⓕ Emotional disturbance	
Ⓑ Hearing impairment	ID100251	Ⓖ Orthopedic impairment	
Ⓒ Visual impairment/blindness	ID100252	Ⓗ Traumatic brain injury	
Ⓓ Speech impairment	ID100253	Ⓘ Other (specify) _____	
Ⓔ Mental or cognitive impairment	ID100254		

4. What is the degree of this student's disability?

Ⓐ Profound

Ⓑ Severe

Ⓒ Moderate

Ⓓ Mild

5. Does this student have an Individualized Education Plan (IEP) or equivalent classification?

Ⓐ Yes, IEP

Ⓑ Yes, equivalent classification (define) _____

Ⓒ No

6. Has the IEP team or an equivalent group determined that the student cannot participate in assessments such as NAEP?

Ⓐ No

Ⓑ Yes

7. Is this student's cognitive functioning so severely impaired that he/she cannot participate in this assessment?

Ⓐ No

Ⓑ Yes

8. What percentage of time is this student mainstreamed (i.e., with his/her nondisabled peers) **in academic subjects** (e.g., mathematics, reading/language arts, science)?

Ⓐ 0%

Ⓑ 1-24%

Ⓒ 25-49%

Ⓓ 50-74%

Ⓔ 75-99%

Ⓕ 100%

Ⓖ don't know.

9. What percentage of time **in the total school day** is this student served by a special education program (both in a class with his/her nondisabled peers and outside such a class)?

Ⓐ 0%

Ⓑ 1-24%

Ⓒ 25-49%

Ⓓ 50-74%

Ⓔ 75-99%

Ⓕ 100%

Ⓖ don't know.

10. In which areas is this student currently receiving instruction as part of a special education program? **(Grid in all that apply.)**

Ⓐ Language development	ID100260	Ⓕ Personal care and basic life skills
Ⓑ Reading	ID100261	Ⓖ Vocational education
Ⓒ Mathematics	ID100262	Ⓗ Other (specify) _____
Ⓓ Speech (e.g., articulation, voice, speech flow)	ID100263	Ⓘ This student does not receive special education instruction in any area.
Ⓔ Self-control and deportment	ID100264	

11. What grade level of instruction is this student currently receiving in reading/language arts?

- Ⓐ Lower than Kindergarten
- Ⓑ Kindergarten
- Ⓒ Grade 1
- Ⓓ Grade 2
- Ⓔ Grade 3
- Ⓕ Grade 4
- Ⓖ Grade 5
- Ⓗ Grade 6
- Ⓘ Grade 7
- Ⓙ Grade 8
- Ⓚ Grade 9
- Ⓛ Grade 10
- Ⓜ Grade 11
- Ⓝ Grade 12
- Ⓞ Student not taking reading/language arts
- Ⓟ don't know.

12. What grade level of instruction is this student currently receiving in mathematics?

- Ⓐ Lower than Kindergarten
- Ⓑ Kindergarten
- Ⓒ Grade 1
- Ⓓ Grade 2
- Ⓔ Grade 3
- Ⓕ Grade 4
- Ⓖ Grade 5
- Ⓗ Grade 6
- Ⓘ Grade 7
- Ⓙ Grade 8
- Ⓚ Grade 9
- Ⓛ Grade 10
- Ⓜ Grade 11
- Ⓝ Grade 12
- Ⓞ Student not taking mathematics
- Ⓟ I don't know.

13. Are any accommodations or adaptations used for achievement testing for this student?

- Ⓐ IEP states that student cannot be tested. **[GO TO QUESTION 18.]**
- Ⓑ No **[GO TO QUESTION 18.]**
- Ⓒ Yes

Questions 14-17. If your answer to question 13 is "Yes," which accommodations or adaptations are used for achievement testing with this student?

14. Presentation Accommodations (Grid in all that apply.)

- Ⓐ Read directions aloud — ID100269
- Ⓑ Read problems aloud (except on reading tests) — ID100270
- Ⓒ Signing of directions — ID100271
- Ⓓ Use of taped version of test — ID100272
- Ⓔ Assistance with interpretation of directions — ID100273
- Ⓕ Braille edition of test
- Ⓖ Large-print edition of test
- Ⓗ Use of magnifying equipment
- Ⓘ Other (specify) _____

15. Response Accommodations (Grid in all that apply.)

- Ⓐ Response in Braille — ID100278
- Ⓑ Response in sign language — ID100279
- Ⓒ Oral responses — ID100280
- Ⓓ Pointing to answers — ID100281
- Ⓔ Tape recording of answers — ID100282
- Ⓕ Use of computer to respond — ID100283
- Ⓖ Use of typewriter to respond
- Ⓗ Use of calculator including talking or Braille calculators
- Ⓘ Use of template to respond
- Ⓙ Use of large marking pen or specially designed writing tool
- Ⓚ Other (specify) _____

16. Setting Accommodations (Grid in all that apply.)

- Ⓐ Test in small group
- Ⓑ Test individually
- Ⓒ Other (specify) _____

17. Timing Accommodations (Grid in all that apply.)

- Ⓐ Extended time
- Ⓑ More breaks during test
- Ⓒ Test sessions over several days
- Ⓓ Other (specify) _____

18. In your judgment, could this student meaningfully participate in the NAEP civics, reading, and writing assessments without accommodations or adaptations?

    Ⓐ No

    Ⓑ Yes

19. If accommodations and/or adaptations were available, how would this student participate in the NAEP assessment?

    Ⓐ Without accommodations or adaptations

    Ⓑ With the accommodations or adaptations specified for achievement testing of this student

    Ⓒ The IEP team or an equivalent group has determined that the student cannot participate in assessments such as NAEP.

SECTION B: STUDENTS WITH LIMITED ENGLISH PROFICIENCY

Complete this section if the student has limited English proficiency.

20. How long has this student lived in the United States?

- Ⓐ All his/her life
- Ⓑ More than 5 years but not all his/her life
- Ⓒ 3-5 years
- Ⓓ Less than 3 years
- Ⓔ don't know.

21. What is this student's first or native language?

- Ⓐ Spanish
- Ⓑ Another language (specify) _____

22. Since reaching school age, how regularly has this student attended school in the United States or in another country?

- Ⓐ Continuously
- Ⓑ Intermittently
- Ⓒ Little or not at all
- Ⓓ don't know.

23. Counting this year, how many years has this student been enrolled in a school where English is the primary language of instruction?

- Ⓐ The primary language of instruction in this school is not English.
- Ⓑ 1 year
- Ⓒ 2 years
- Ⓓ 3 years
- Ⓔ 4 years or more
- Ⓕ don't know.

24. For how many complete school years has this student been receiving **academic instruction** (mathematics, reading/language arts) primarily in English?

Ⓐ Student does not receive academic instruction primarily in English.

Ⓑ 1 year

Ⓒ 2 years

Ⓓ 3 years

Ⓔ 4 years or more

Ⓕ don't know.

25. Counting this year, how many years has this student received academic instruction specially designed for students with limited English proficiency (e.g., ESL, content-based ESL, sheltered English content courses, native language support, native language instruction)?

Ⓐ Student is not receiving instruction specially designed for LEP students. **[GO TO QUESTION 32.]**

Ⓑ 1 year

Ⓒ 2 years

Ⓓ 3 years

Ⓔ 4 years or more

Ⓕ don't know.

26. During the years this student has received specially designed academic instruction, in what language has instruction been provided?

Ⓐ English only

Ⓑ Primarily English with some instruction in first language

Ⓒ About equally in English and in first language

Ⓓ Primarily in first language with some instruction in English

Ⓔ In first language only

Ⓕ don't know.

27. In which language could this student **best** demonstrate his/her reading ability?

- Ⓐ English
- Ⓑ Spanish
- Ⓒ Other (specify) _____
- Ⓓ I don't know.

28. In which language could this student **best** demonstrate his/her writing ability?

- Ⓐ English
- Ⓑ Spanish
- Ⓒ Other (specify)
- Ⓓ I don't know.

29. **During this school year**, what percentage of this student's **academic instruction** is provided in his/her native language?

- Ⓐ 0%
- Ⓑ 1-24%
- Ⓒ 25-49%
- Ⓓ 50-74%
- Ⓔ 75-99%
- Ⓕ 100%

Questions 30-31. During this school year, has this student received any of the following types of instruction specially designed for LEP students? **(Grid in one oval on each line.)**

	Specially designed instruction in English (such as ESL)	Native language instruction	Mainstreamed with no specially designed instruction
30. Reading/language arts	Ⓐ	Ⓑ	Ⓒ
31. Mathematics	Ⓐ	Ⓑ	Ⓒ

32. What grade level of instruction in the English language is this student receiving in reading/language arts?

- Ⓐ Student is receiving instruction in his/her native language only.
- Ⓑ Lower than Kindergarten
- Ⓒ Kindergarten
- Ⓓ Grade 1
- Ⓔ Grade 2
- Ⓕ Grade 3
- Ⓖ Grade 4
- Ⓗ Grade 5
- Ⓘ Grade 6
- Ⓙ Grade 7
- Ⓚ Grade 8
- Ⓛ Grade 9
- Ⓜ Grade 10
- Ⓝ Grade 11
- Ⓞ Grade 12

33. What grade level of instruction in the English language is this student receiving in mathematics?

- Ⓐ Student is receiving instruction in his/her native language only.
- Ⓑ Lower than Kindergarten
- Ⓒ Kindergarten
- Ⓓ Grade 1
- Ⓔ Grade 2
- Ⓕ Grade 3
- Ⓖ Grade 4
- Ⓗ Grade 5
- Ⓘ Grade 6
- Ⓙ Grade 7
- Ⓚ Grade 8
- Ⓛ Grade 9
- Ⓜ Grade 10
- Ⓝ Grade 11
- Ⓞ Grade 12

Questions 34-37. How would you characterize this student's English proficiency? **(Grid in one oval on each line.)**

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	Good (LEP advanced)	Fair (LEP intermediate)	Poor (LEP beginning)	No proficiency	I don't know.
34. Understanding	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
35. Speaking	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
36. Reading	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
37. Writing	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

38. Are any accommodations or adaptations used for achievement testing for this student?

Ⓐ IEP states that student cannot be tested. **[GO TO QUESTION 40.]**

Ⓑ No **[GO TO QUESTION 40.]**

Ⓒ Yes

39. If your answer to question 38 is "Yes," which accommodations or adaptations are used for achievement testing with this student? (**Grid in all that apply**.)

Ⓐ Native language version of test

Ⓑ Word lists or glossaries

Ⓒ English/native language dictionary

Ⓓ Help from a native speaker in interpreting directions and questions

Ⓔ Directions read aloud in English

Ⓕ Questions read aloud in English

Ⓖ Extended time

Ⓗ Other (specify) _____

40. In your judgement, could this student participate meaningfully in the NAEP assessment without adaptations or accommodations?

Ⓐ No

Ⓑ Yes

41. If accommodations and/or adaptations were available, how would this student participate in the NAEP assessment?

Ⓐ In English without accommodations or adaptations

Ⓑ In English with the accommodations or adaptations specified for achievement testing of this student

Ⓒ In his/her native language

Ⓓ In his/her native language with the accommodations or adaptations specified for achievement testing of this student

Ⓔ This student would not participate.

THANK YOU FOR YOUR COOPERATION.

Appendix B

Summaries of Differential Item Functioning (DIF) Analyses

The tables in appendix B display the numbers of items classified into one of six categories, each of which is designated by a letter and a symbol. The letter portion of the designation indicates the DIF category (A, B, or C) to which the item was assigned. The symbol portion of the designation (+ or -), applicable only to B and C items, indicates the direction of the detected DIF. The plus symbol (+) indicates items that were differentially easier for the accommodated group, while the minus symbol (-) indicates items that were differentially difficult for the accommodated group. Counts are provided separately for dichotomous items[1], and polytomous items.[2] The counts for all items combined appear in tables 2.1 and 2.2. In the two cases where the LEP accommodated groups at grade 8 showed two items with a strong indication of DIF results, the advantages were found in both directions (i.e., one dichotomous item was differentially easier for the LEP accommodated students and one polytomous item was harder).

[1] Dichotomous items which may be scored as right or wrong (e.g., multiple-choice and short constructed-response items, are designated A through C in the appendix B tables).

[2] Polytomous items which require longer responses for which a student may give a correct, partially correct, or wrong answer (are designated AA through CC in the appendix B tables).

Table B.1—Summary of differential item functioning (DIF) results, grade 4: 1998

Focal group vs. reference group	Focal group size	Reference group size	DIF category*	Actual analyses
SD nonaccommodated vs. non-SD/LEP	5,449	107,655	A	60
			B+	0
			B–	3
			C+	0
			C–	0
			AA	19
			BB+	0
			BB–	0
			CC+	0
			CC–	0
LEP nonaccommodated vs. non-SD/LEP	2,641	107,655	A	58
			B+	1
			B–	4
			C+	0
			C–	0
			AA	19
			BB+	0
			BB–	0
			CC+	0
			CC–	0
SD/LEP nonaccommodated vs. non-SD/LEP	7,953	107,655	A	61
			B+	0
			B–	2
			C+	0
			C–	0
			AA	19
			BB+	0
			BB–	0
			CC+	0
			CC–	0
SD accommodated vs. SD nonaccommodated plus non-SD/LEP	1,390	7,179	A	9
			B+	0
			B–	0
			C+	0
			C–	0
			AA	8
			BB+	0
			BB–	1
			CC+	0
			CC–	0
SD accommodated (regular sessions) vs. SD nonaccommodated plus non-SD/LEP	636	7,179	A	9
			B+	0
			B–	0
			C+	0
			C–	0
			AA	9
			BB+	0
			BB–	0
			CC+	0
			CC–	0

See footnotes at end of table. ▶

Table B.1—Continued

Focal group vs. reference group	Focal group size	Reference group size	DIF category*	Actual analyses
SD accommodated (other sessions) vs. SD nonaccommodated plus non-SD/LEP	754	7,179	A B+ B– C+ C– AA BB+ BB– CC+ CC–	9 0 0 0 0 8 0 1 0 0
LEP accommodated vs. LEP nonaccommodated plus non-SD/LEP	140	6,972	A B+ B– C+ C– AA BB+ BB– CC+ CC–	4 0 5 0 0 9 0 0 0 0
LEP accommodated (regular sessions) vs. LEP nonaccommodated plus non-SD/LEP	77	6,972	A B+ B– C+ C– AA BB+ BB– CC+ CC–	7 0 2 0 0 8 0 0 0 1
LEP accommodated (other sessions) vs. LEP nonaccommodated plus non-SD/LEP	63	6,972	A B+ B– C+ C– AA BB+ BB– CC+ CC–	9 0 0 0 0 8 0 0 1 0

NOTE: SD = Students with disabilities

LEP = Limited-English-proficient students

* Single letter codes refer to dichotomously scored items; double letter codes refer to polytomously scored items. The symbol portion of the designation (+ or –), applicable only to B and C items, indicates the direction of the detected DIF. The "+" symbol indicates items that were differentially easier for the focal group, while the "–" symbol indicates items that were differentially difficult for the focal group.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table B.2—Summary of differential item functioning (DIF) results, grade 8: 1998

Focal group vs. reference group	Focal group size	Reference group size	DIF category*	Actual analyses
SD nonaccommodated vs. non-SD/LEP	5,172	90,794	A	70
			B+	0
			B–	3
			C+	0
			C–	0
			AA	37
			BB+	0
			BB–	0
			CC+	0
			CC–	0
LEP nonaccommodated vs. non-SD/LEP	1,666	90,794	A	63
			B+	0
			B–	8
			C+	1
			C–	1
			AA	35
			BB+	2
			BB–	0
			CC+	0
			CC–	0
SD/LEP nonaccommodated vs. non-SD/LEP	6,715	90,794	A	72
			B+	0
			B–	1
			C+	0
			C–	0
			AA	37
			BB+	0
			BB–	0
			CC+	0
			CC–	0
SD accommodated vs. SD nonaccommodated plus non-SD/LEP	1,073	4,370	A	14
			B+	0
			B–	0
			C+	0
			C–	0
			AA	6
			BB+	0
			BB–	0
			CC+	0
			CC–	0
SD accommodated (regular sessions) vs. SD nonaccommodated plus non-SD/LEP	598	4,370	A	14
			B+	0
			B–	0
			C+	0
			C–	0
			AA	6
			BB+	0
			BB–	0
			CC+	0
			CC–	0

See footnotes at end of table. ▶

Table B.2—Continued

Focal group vs. reference group	Focal group size	Reference group size	DIF category*	Actual analyses
SD accommodated (other sessions) vs. SD nonaccommodated plus non-SD/LEP	475	4,370	A B+ B– C+ C– AA BB+ BB– CC+ CC–	14 0 0 0 0 6 0 0 0 0
LEP accommodated vs. LEP nonaccommodated plus non-SD/LEP	111	4,198	A B+ B– C+ C– AA BB+ BB– CC+ CC–	10 1 2 1 0 5 0 0 0 1
LEP accommodated (regular sessions) vs. LEP nonaccommodated plus non-SD/LEP	82	4,198	A B+ B– C+ C– AA BB+ BB– CC+ CC–	7 3 3 1 0 5 0 0 0 1
LEP accommodated (other sessions) vs. LEP nonaccommodated plus non-SD/LEP	29	4,198	A B+ B– C+ C– AA BB+ BB– CC+ CC–	13 1 0 0 0 5 0 0 0 1

NOTE: SD = Students with disabilities

LEP = Limited-English-proficient students

* Single letter codes refer to dichotomously scored items; double letter codes refer to polytomously scored items. The symbol portion of the designation (+ or –), applicable only to B and C items, indicates the direction of the detected DIF. The "+" symbol indicates items that were differentially easier for the focal group, while the "–" symbol indicates items that were differentially difficult for the focal group.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Appendix C

Sample Sizes by State, Accommodated and Nonaccommodated

Tables C.1 and C.2 provide the number of students for each participating state and jurisdiction in the NAEP 1998 state reading assessment for grades 4 and 8, respectively. The display is restricted to the reporting sample in which accommodations were permitted because this sample is the source of the data in the present report. The SD columns include only those students who were not also classified as LEP, and the LEP columns include only those LEP students who were not also classified as SD.

Table C.1—Number of students identified as non-SD/LEP, SD-only, and LEP-only, by accommodation status and state, grade 4: 1998

		SD-only			LEP-only		
	All non-SD/LEP	Total	Non accommodated	Accommodated	Total	Non accommodated	Accommodated
Nation	5,889	295	174	121	265	231	34
Alabama	2,422	52	39	13	1	0	1
Arizona	2,253	67	60	7	95	83	12
Arkansas	2,497	69	47	22	7	7	0
California †	1,537	26	18	8	146	139	7
Colorado	2,412	101	61	40	24	22	2
Connecticut	2,408	99	55	44	23	22	1
Delaware	2,185	145	101	44	27	26	1
Florida	2,337	142	75	67	50	46	4
Georgia	2,598	80	44	36	6	5	1
Hawaii	2,459	87	66	21	53	53	0
Iowa †	2,137	100	70	30	6	6	0
Kansas †	1,779	53	24	29	24	23	1
Kentucky	2,390	64	33	31	1	1	0
Louisiana	2,544	105	34	71	9	9	0
Maine	2,277	103	58	45	3	3	0
Maryland	2,205	81	30	51	20	18	2
Massachusetts †	2,153	129	75	54	36	25	11
Michigan	2,317	44	26	18	6	6	0
Minnesota †	2,138	103	70	33	44	36	8
Mississippi	2,515	38	31	7	1	1	0
Missouri	2,397	111	47	64	6	5	1
Montana †	1,797	88	65	23	1	0	1
Nevada	2,478	64	53	11	70	64	6
New Hampshire †	1,702	97	49	48	6	6	0
New Mexico	2,067	88	66	22	167	158	9
New York †	2,159	81	15	66	15	15	0
North Carolina	2,438	98	27	71	15	13	2
Oklahoma	2,482	55	38	17	16	16	0
Oregon	2,197	102	64	38	47	38	9
Rhode Island	2,335	120	77	43	43	34	9
South Carolina	2,326	99	68	31	8	8	0
Tennessee	2,491	102	85	17	6	6	0
Texas	2,065	96	66	30	100	95	5
Utah	2,536	78	56	22	22	18	4
Virginia	2,504	107	49	58	11	7	4
Washington	2,227	82	49	33	29	27	2
West Virginia	2,481	49	27	22	1	1	0
Wisconsin †	2,014	88	56	32	22	20	2
Wyoming	2,498	133	87	46	3	2	1
Other Jurisdictions							
District of Columbia	2,286	53	30	23	56	39	17
DDESS	2,582	42	23	19	4	0	4
DoDDS	2,562	43	30	13	14	14	0
Virgin Islands	1,452	5	5	0	11	6	5

† Indicates jurisdiction did not meet one or more of the guidelines for school participation. See Donahue, P. L., Voelkl, K. E., Campbell, J. R., and Mazzeo, J. (1999). *The NAEP 1998 reading report card for the nation and the states* (NCES 1999–500), p. 155. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

SD = Students with disabilities. LEP = Limited-English-proficient students.

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.DoDDS: Department of Defense Dependent Schools (Overseas).

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table C.2—Number of students identified as non-SD/LEP, SD-only, and LEP-only, by accommodation status and state, grade 8: 1998

		SD-only			LEP-only		
	All non-SD/LEP	Total	Non accommodated	Accommodated	Total	Non accommodated	Accommodated
Nation	8,366	532	363	169	297	269	28
Alabama	2,342	61	56	5	1	1	0
Arizona	2,206	77	59	18	116	114	2
Arkansas	2,346	71	62	9	4	2	2
California †	1,782	70	52	18	146	142	4
Colorado	2,425	94	58	36	35	29	6
Connecticut	2,388	114	78	36	11	8	3
Delaware	1,882	90	69	21	3	3	0
Florida	2,252	115	83	32	37	36	1
Georgia	2,415	85	53	32	16	11	5
Hawaii	2,362	97	79	18	40	23	17
Kansas †	1,789	57	42	15	16	15	1
Kentucky	2,231	58	33	25	1	1	0
Louisiana	2,426	106	45	61	0	0	0
Maine	2,281	108	71	37	3	3	0
Maryland †	2,026	82	29	53	9	8	1
Massachusetts	2,044	149	91	58	15	13	2
Minnesota †	1,823	79	63	16	29	24	5
Mississippi	2,236	53	45	8	3	3	0
Missouri	2,433	104	64	40	2	1	1
Montana †	1,803	64	55	9	5	5	0
Nevada	2,335	75	56	19	38	32	6
New Mexico	2,000	108	71	37	60	56	4
New York †	1,778	61	18	43	19	16	3
North Carolina	2,420	101	39	62	7	4	3
Oklahoma	2,120	38	29	9	14	14	0
Oregon	2,052	98	60	38	23	14	9
Rhode Island	2,223	108	90	18	11	11	0
South Carolina	2,357	77	59	18	3	3	0
Tennessee	2,050	85	73	12	1	1	0
Texas	2,167	101	74	27	72	70	2
Utah	2,429	68	54	14	18	15	3
Virginia	2,414	94	47	47	5	5	0
Washington	2,120	94	58	36	24	24	0
West Virginia	2,381	94	60	34	1	0	1
Wisconsin †	1,850	75	42	33	4	4	0
Wyoming	2,400	115	90	25	2	2	0
Other Jurisdictions							
District of Columbia	1,483	57	40	17	2	1	1
DDESS	591	19	11	8	1	0	1
DoDDS	2,099	73	50	23	9	8	1
Virgin Islands	643	0	0	0	0	0	0

† Indicates jurisdiction did not meet one or more of the guidelines for school participation. See Donahue, P. L., Voelkl, K. E., Campbell, J. R., and Mazzeo, J. (1999). *The NAEP 1998 reading report card for the nation and the states* (NCES 1999–500), p. 155. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

SD = Students with disabilities. LEP = Limited-English-proficient students.

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependent Schools (Overseas).

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Appendix D

Data Appendix with Standard Errors

This appendix contains complete data for all the tables presented in this report, including average scores, achievement-level results, and percentages of students. In addition, standard errors appear in parentheses next to each average score and percentage. The comparisons presented in this report are based on statistical tests that consider the magnitude of the difference between group averages or percentages and the standard errors of those statistics. Because NAEP scores and percentages are based on samples rather than the entire population(s), the results are subject to a measure of uncertainty reflected in the standard errors of the estimates. It can be said with 95 percent certainty that for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Table D.1—Data for Table 3.1 Sample size, percentage of students, and average reading scores, by SD status and accommodation status, grades 4 and 8: 1998

	Number of students	Weighted percentage	Average score
Grade 4			
Total students	104,491	100	213 (0.6)
Non-SD/LEP	99,024	89 (0.4)	217 (0.6) †
SD-only	3,852	7 (0.2)	181 (2.2)
Nonaccommodated	2,318	4 (0.2)	184 (2.5)
Accommodated	1,534	3 (0.1)	177 (3.0)
All-SD	3,951	7 (0.2)	180 (2.2)
Nonaccommodated	2,381	4 (0.2)	183 (2.4)
Accommodated	1,570	3 (0.1)	176 (3.0)
Grade 8			
Total students	95,460	100	261 (0.5)
Non-SD/LEP	90,424	90 (0.4)	265 (0.5) †
SD-only	3,784	7 (0.4)	225 (1.4)
Nonaccommodated	2,551	4 (0.2)	229 (1.5) *
Accommodated	1,233	3 (0.3)	218 (1.9)
All-SD	3,915	7 (0.4)	224 (1.4)
Nonaccommodated	2,650	5 (0.2)	228 (1.6) *
Accommodated	1,265	3 (0.3)	218 (1.9)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.

SD = Students with disabilities

LEP = Limited-English-proficient students

† The non-SD/LEP group is significantly different from the SD-only and all-SD groups.

* Nonaccommodated group is significantly different from the accommodated group.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.2—Data for Table 3.2 Percentage of students in NAEP reading assessment identified as non-SD/LEP and SD-only, by race/ethnicity and accommodation status, grades 4 and 8: 1998

	White	Black	Hispanic	Asian/ Pacific Islander	American Indian
Grade 4					
Non-SD/LEP	63 (0.7)	16 (0.5)	14 (0.4)	4 (0.2) †	2 (0.1) †
SD-only	64 (2.2)	14 (1.2)	17 (1.7)	2 (0.5)	4 (0.5)
Nonaccommodated	62 (2.2)	13 (1.3)	19 (2.1)	2 (0.4)	4 (0.6)
Accommodated	65 (3.0)	15 (2.2)	13 (2.5)	2 (0.7)	5 (0.8)
Grade 8					
Non-SD/LEP	66 (0.8)	15 (0.5)	13 (0.4) †	4 (0.3) †	2 (0.1)
SD-only	65 (1.6)	14 (1.0)	17 (1.2)	1 (0.2)	3 (0.4)
Nonaccommodated	66 (2.0)	15 (1.2)	16 (1.5)	2 (0.3) *	2 (0.3)
Accommodated	65 (2.6)	14 (1.7)	18 (1.9)	1 (0.2)	3 (0.8)

NOTE: Standard errors of the estimated percentages appear in parentheses.

SD = Students with disabilities

LEP = Limited-English-proficient students

† The non-SD/LEP group is significantly different from the SD-only group.

* Nonaccommodated group is significantly different from the accommodated group.

Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.3—Data for Table 3.3 Percentage of racial/ethnic student subgroups in NAEP reading assessment identified as SD-only by accommodation status, grades 4 and 8: 1998

	White	Black	Hispanic	Asian/ Pacific Islander	American Indian
Grade 4					
SD-only	7 (0.3)	6 (0.5)	6 (0.7)	3 (0.8)	13 (1.3)
Nonaccommodated	4 (0.2)	3 (0.3)	4 (0.6)	2 (0.4)	6 (1.0)
Accommodated	3 (0.2)	3 (0.4)	2 (0.5)	1 (0.5)	7 (1.1)
Grade 8					
SD-only	7 (0.5)	7 (0.5)	7 (0.6)	2 (0.3)	11 (1.4)
Nonaccommodated	4 (0.3)	4 (0.4)	4 (0.4)	2 (0.2)	6 (0.9)
Accommodated	3 (0.3)	2 (0.3)	3 (0.5)	# (0.1)	5 (1.1)

NOTE: Standard errors of the estimated percentages appear in parentheses.

SD = Students with disabilities

Percentage is between .0 and .5.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.4—Data for Table 3.4 Percentage of students identified as non-SD/LEP and SD-only at or above reading achievement levels, by accommodation status, grades 4 and 8: 1998

	At or above *Basic*	At or above *Proficient*	At *Advanced*
Grade 4			
Non-SD/LEP	63 (0.7) †	30 (0.6) †	6 (0.3)
SD-only	27 (2.3)	8 (1.6)	1 (***)
Nonaccommodated	29 (2.8)	10 (2.7)	1 (***)
Accommodated	26 (2.8)	6 (1.1)	1 (0.4)
Grade 8			
Non-SD/LEP	77 (0.6) †	32 (0.6) †	2 (0.2)
SD-only	32 (2.0)	5 (0.6)	# (***)
Nonaccommodated	37 (2.4) *	6 (0.9) *	# (***)
Accommodated	23 (2.4)	3 (0.7)	# (***)

NOTE: Standard errors of the estimated percentages appear in parentheses.
SD = Students with disabilities
LEP = Limited-English-proficient students
(***) Standard error estimates cannot be accurately determined.
† The non-SD/LEP group is significantly different from the SD-only group.
* Nonaccommodated group is significantly different from the accommodated group.
# Percentage is between .0 and .5.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.5—Data for Table 3.5 Percentage of students identified as non-SD/LEP and SD-only, and average reading scores, by gender and accommodation status, grades 4 and 8: 1998

	Male	Female
Grade 4		
Non-SD/LEP		
Weighted percentage	49 (0.3)	51 (0.3)
Average score	215 (0.6) †	220 (0.7) †
SD-only		
Weighted percentage	67 (1.2)	33 (1.2)
Average score	180 (2.5)	183 (2.5)
Nonaccommodated		
Weighted percentage	67 (1.5)	33 (1.5)
Average score	183 (2.9)	185 (3.5)
Accommodated		
Weighted percentage	67 (2.0)	33 (2.0)
Average score	175 (3.6)	180 (3.0)
Grade 8		
Non-SD/LEP		
Weighted percentage	49 (0.3)	51 (0.3)
Average score	260 (0.6) †	271 (0.5) †
SD-only		
Weighted percentage	67 (1.4)	33 (1.4)
Average score	223 (1.5)	229 (2.1)
Nonaccommodated		
Weighted percentage	66 (1.7)	34 (1.7)
Average score	226 (1.8) *	235 (1.9) *
Accommodated		
Weighted percentage	69 (2.1)	31 (2.1)
Average score	219 (1.8)	218 (3.5)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.

SD = Students with disabilities

LEP = Limited-English-proficient students

† The non-SD/LEP group is significantly different from the SD-only group.

* Nonaccommodated group is significantly different from the accommodated group.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.6—Data for Table 3.6 Percentage of students identified as SD-only, an average reading scores, by disability type and accommodation status, grades 4 and 8: 1998

	Learning disabled	Hearing, speech, or visual	Mental cognitive, emotional, multiple, other	Information not available
Grade 4				
SD-only				
Weighted percentage	50 (1.8)	10 (0.8)	18 (1.4)	22 (1.4)
Average score	178 (2.9)	197 (7.2)	175 (3.0)	185 (2.6)
Nonaccommodated				
Weighted percentage	47 (3.0)	15 (1.4)	17 (2.4)	21 (2.0)
Average score	180 (3.6)	198 (8.3)	177 (3.7)	187 (2.8)
Accommodated				
Weighted percentage	55 (2.1)	4 (0.8)	18 (1.5)	23 (1.7)
Average score	176 (4.2)	186 (6.5)	171 (4.2)	182 (3.8)
Grade 8				
SD-only				
Weighted percentage	62 (1.5)	3 (0.6)	13 (0.9)	23 (1.7)
Average score	226 (1.5)	245 (7.8)	218 (3.1)	225 (2.0)
Nonaccommodated				
Weighted percentage	64 (1.3)	4 (0.9)	13 (1.2)	19 (1.2)
Average score	228 (1.9) *	249 (7.4)	224 (3.1) *	233 (2.6) *
Accommodated				
Weighted percentage	58 (3.4)	1 (0.4)	11 (1.5)	30 (4.1)
Average score	221 (1.9)	*** (***)	207 (5.5)	217 (2.9)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.

SD = Students with disabilities

* Nonaccommodated group is significantly different from the accommodated group.

***(***) Sample size is insufficient to permit a reliable estimate.

Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.7a—Data for Table 3.7a Percentage of students identified as SD-only, and average reading scores, by estimated degree of students' disability and accommodation status, grades 4 and 8: 1998

	Mild	Moderate	Profound / severe	Information not available
Grade 4				
SD-only				
Weighted percentage	46 (2.7)	32 (1.7)	7 (0.7)	16 (1.1)
Average score	187 (3.5)	172 (3.0)	170 (4.8)	184 (2.7)
Nonaccommodated				
Weighted percentage	50 (3.2)	28 (2.1)	6 (0.9)	15 (1.6)
Average score	191 (4.1)	172 (2.2)	168 (5.9)	188 (2.9)
Accommodated				
Weighted percentage	40 (3.1)	36 (2.5)	8 (1.0)	17 (1.6)
Average score	181 (3.9)	172 (5.7)	172 (5.8)	179 (4.4)
Grade 8				
SD-only				
Weighted percentage	47 (2.0)	28 (1.2)	6 (0.5)	19 (1.6)
Average score	231 (2.1)	222 (2.5)	207 (4.8)	221 (2.0)
Nonaccommodated				
Weighted percentage	51 (1.8)	29 (1.6)	5 (0.8)	15 (1.1)
Average score	234 (1.9)	226 (3.0) *	206 (5.4)	229 (2.7) *
Accommodated				
Weighted percentage	42 (4.1)	27 (2.4)	6 (1.0)	26 (3.9)
Average score	224 (3.7)	216 (3.0)	210 (9.4)	214 (3.4)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.

SD = Students with disabilities

* Nonaccommodated group is significantly different from the accommodated group.

Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.7b—Data for Table 3.7b Percentage of students identified as LD-only, and average reading scores, by estimated degree of students' disability and accommodation status, grades 4 and 8: 1998

	Mild	Moderate	Profound/ severe	Information not available
Grade 4				
LD-only				
Weighted percentage	55 (3.1)	39 (2.7)	5 (0.8)	1 (0.3)
Average score	185 (3.6)	169 (4.1)	159 (6.9)	*** (***)
Nonaccommodated				
Weighted percentage	61 (3.2)	34 (3.0)	4 (0.8)	1 (0.5)
Average score	187 (4.7)	167 (2.9)	*** (***)	*** (***)
Accommodated				
Weighted percentage	49 (4.5)	44 (4.1)	6 (1.3)	1 (0.3)
Average score	182 (4.6)	171 (7.3)	*** (***)	*** (***)
Grade 8				
LD-only				
Weighted percentage	62 (1.8)	31 (1.5)	5 (0.8)	2 (0.6)
Average score	230 (2.0)	221 (2.9)	199 (6.3)	*** (***)
Nonaccommodated				
Weighted percentage	64 (2.2)	29 (1.9)	5 (1.1)	2 (0.8)
Average score	231 (2.0)	224 (3.8)	199 (8.3)	*** (***)
Accommodated				
Weighted percentage	58 (3.5)	35 (2.9)	6 (1.5)	1 (0.6)
Average score	226 (3.4)	215 (3.5)	*** (***)	*** (***)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.

LD = Learning-disabled students

***(***) Sample size is insufficient to permit a reliable estimate.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.8—Data for Table 3.8 Percentage of students identified as LD-only, and average reading scores, by gender and accommodation status, grades 4 and 8: 1998

	Male	Female
Grade 4		
LD-only		
Weighted percentage	70 (1.7)	30 (1.7)
Average score	176 (3.6)	181 (2.6)
Nonaccommodated		
Weighted percentage	69 (2.4)	31 (2.4)
Average score	177 (4.5)	182 (3.7)
Accommodated		
Weighted percentage	71 (2.7)	29 (2.7)
Average score	174 (5.1)	180 (4.0)
Grade 8		
LD-only		
Weighted percentage	67 (2.0)	33 (2.0)
Average score	222 (1.4)	232 (2.2)
Nonaccommodated		
Weighted percentage	64 (2.3)	36 (2.3)
Average score	223 (1.8)	236 (2.4) *
Accommodated		
Weighted percentage	71 (3.1)	29 (3.1)
Average score	220 (2.0)	223 (3.8)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.
LD = Learning-disabled-students
* Nonaccommodated group is significantly different from the accommodated group.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.9—Data for Table 3.9 Percentage of students identified as SD-only, and average reading scores, by accommodation type, grades 4 and 8: 1998

	Large print test book	Extended time	Small group	One-on-one testing	Scribe/ computer	Other
Grade 4						
SD-only						
Weighted percentage	1 (0.3)	44 (2.7)	46 (2.7)	5 (1.1)	3 (0.6)	1 (0.4)
Average score	*** (***)	180 (4.8)	171 (3.8)	182 (6.2)	203 (11.1)	*** (***)
Grade 8						
SD-only						
Weighted percentage	5 (***)	53 (4.2)	38 (3.9)	2 (0.5)	1 (0.3)	1 (0.2)
Average score	*** (***)	218 (2.9)	218 (2.4)	*** (***)	*** (***)	*** (***)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.

SD = Students with disabilities

(***) Standard error estimates cannot be accurately determined.

***(***) Sample size is insufficient to permit a reliable estimate.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.10—Data for Table 4.1 Sample size, percentage of students, and average reading scores, by LEP status and accommodation status, grades 4 and 8: 1998

	Number of students	Weighted percentage	Average score
Grade 4			
Total students	104,491	100	213 (0.6)
Non-SD/LEP	99,024	89 (0.4)	217 (0.6) †
LEP-only	1,516	4 (0.3)	174 (2.8)
Nonaccommodated	1,358	4 (0.2)	175 (3.0)
Accommodated	158	# (0.1)	171 (6.1) !
All-LEP	1,615	4 (0.3)	173 (2.7)
Nonaccommodated	1,421	4 (0.2)	174 (3.0)
Accommodated	194	# (0.1)	167 (5.4) !
Grade 8			
Total students	95,460	100	261 (0.5)
Non-SD/LEP	90,424	90 (0.4)	265 (0.5) †
LEP-only	1,121	3 (0.2)	224 (2.1)
Nonaccommodated	1,009	3 (0.2)	226 (2.1)
Accommodated	112	# (0.1)	203 (9.5) !
All-LEP	1,252	3 (0.3)	222 (2.0)
Nonaccommodated	1,108	3 (0.3)	224 (2.0) *
Accommodated	144	# (0.1)	202 (7.3)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.
SD = Students with disabilities
LEP = Limited-English-proficient students
† The non-SD/LEP group is significantly different from the LEP-only and all-LEP groups.
# Percentage is between .0 and .5.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
* Nonaccommodated group is significantly different from the accommodated group.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.11—Data for Table 4.2 Percentage of students in NAEP reading assessment identified as SD-only and LEP-only, by region of U.S., grades 4 and 8: 1998

	Northeast	Southeast	Central	West
Grade 4				
SD-only	22 (2.2)	28 (1.6)	23 (2.9)	28 (1.8)
LEP-only	7 (1.1)	7 (0.9)	6 (0.8)	81 (1.6)
Grade 8				
SD-only	21 (2.5)	26 (1.5)	22 (3.1)	30 (1.9)
LEP-only	8 (1.5)	7 (1.0)	6 (1.4)	79 (2.1)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.

SD = Students with disabilities

LEP = Limited-English-proficient students

Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.12—Data for Table 4.3 Percentage of students identified as non-SD/LEP and LEP-only at or above reading achievement levels, by accommodation status, grades 4 and 8: 1998

	At or above *Basic*	At or above *Proficient*	At *Advanced*
Grade 4			
Non-SD/LEP	63 (0.7) †	30 (0.6) †	6 (0.3) †
LEP-only	19 (2.5)	5 (1.3)	1 (0.3)
Nonaccommodated	19 (2.7)	5 (1.4)	# (***)
Accommodated	19 (4.5) !	5 (2.0) !	1 (***)
Grade 8			
Non-SD/LEP	77 (0.6) †	32 (0.6) †	2 (0.2)
LEP-only	30 (2.8)	3 (0.9)	# (***)
Nonaccommodated	31 (3.2)	3 (0.9)	# (***)
Accommodated	17 (7.6) !	2 (***)	0 (***)

NOTE: Standard errors of the estimated percentages appear in parentheses.

SD = Students with disabilities

LEP = Limited-English-proficient students

† Non-SD/LEP group is significantly different from the LEP group.

Percentage is between .0 and .5.

! The nature of the sample does not allow accurate determination of the variability of the statistic.

(***) Standard error estimates cannot be accurately determined.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.13—Data for Table 4.4 Percentage of students identified as non-SD/LEP and LEP-only, and average reading scores, by gender and accommodation status, grades 4 and 8: 1998

	Male	Female
Grade 4		
Non-SD/LEP		
Weighted percentage	49 (0.3)	51 (0.3)
Average score	215 (0.6) †	220 (0.7) †
LEP-only		
Weighted percentage	48 (2.1)	52 (2.1)
Average score	172 (3.0)	176 (3.3)
Nonaccommodated		
Weighted percentage	49 (2.2)	51 (2.2)
Average score	172 (3.1)	177 (3.7)
Accommodated		
Weighted percentage	41 (5.3)	59 (5.3)
Average score	174 (7.7)	168 (7.2)
Grade 8		
Non-SD/LEP		
Weighted percentage	49 (0.3)	51 (0.3)
Average score	260 (0.6) †	271 (0.5) †
LEP-only		
Weighted percentage	53 (2.2)	47 (2.2)
Average score	222 (2.9)	226 (2.6)
Nonaccommodated		
Weighted percentage	51 (2.5)	49 (2.5)
Average score	225 (2.8)	226 (2.6)
Accommodated		
Weighted percentage	81 (6.5)	19 (6.5)
Average score	202 (12.1)	*** (***)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.

SD = Students with disabilities

LEP = Limited-English-proficient students

† The non-SD/LEP group is significantly different from the LEP-only group.

***(***) Sample size is insufficient to permit a reliable estimate.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.14a—Data for Table 4.5a Percentage of students identified as LEP-only, and average reading scores, by years receiving instruction in English or instruction designed for LEP students, grade 4: 1998

	Years of instruction					
	None	One	Two	Three	Four or more	Information not available
Grade 4						
LEP-only						
Instruction in English						
Weighted percentage	6 (3.8)	10 (1.3)	7 (1.7)	7 (1.0)	33 (2.9)	37 (4.3)
Average score	*** (***)	180 (3.6)	169 (9.4)	172 (5.1)	180 (4.0)	172 (3.4)
Nonaccommodated						
Weighted percentage	6 (4.1)	11 (1.4)	7 (1.7)	7 (1.0)	34 (3.4)	34 (4.6)
Average score	*** (***)	180 (3.7)	168 (10.1)	171 (5.1)	179 (4.1)	174 (3.5)
Accommodated						
Weighted percentage	1 (***)	4 (1.9)	7 (3.9)	6 (2.8)	20 (7.2)	63 (10.9)
Average score	*** (***)	*** (***)	*** (***)	179 (18.0)	*** (***)	162 (7.6)
Instruction designed for LEP students						
Weighted percentage	4 (0.7)	5 (1.0)	7 (1.5)	10 (1.4)	34 (3.4)	40 (4.8)
Average score	190 (5.0)	173 (6.2)	179 (5.9)	174 (5.2)	171 (4.7)	175 (3.5)
Nonaccommodated						
Weighted percentage	4 (0.6)	5 (1.1)	7 (1.7)	10 (1.4)	36 (3.3)	37 (4.5)
Average score	187 (5.2)	172 (6.2)	180 (5.8)	174 (5.5)	170 (4.9)	177 (4.4)
Accommodated						
Weighted percentage	6 (3.4)	2 (1.0)	4 (1.7)	5 (2.9)	20 (7.9)	63 (11.3)
Average score	*** (***)	*** (***)	*** (***)	*** (***)	*** (***)	162 (8.1)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.

LEP = Limited-English-proficient students

(***) Standard error estimates cannot be accurately determined.

***(***) Sample size is insufficient to permit a reliable estimate.

Note: Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.14b—Data for Table 4.5b Percentage of students identified as LEP-only, and average reading scores, by years receiving instruction in English or instruction designed for LEP students, grade 8: 1998

	Years of instruction					
	None	One	Two	Three	Four or more	Information not available
Grade 8						
LEP-only						
Instruction in English						
Weighted percentage	1 (0.5)	3 (1.0)	8 (1.3)	8 (1.3)	38 (4.2)	42 (4.3)
Average score	*** (***)	*** (***)	210 (5.8)	222 (5.3)	230 (3.2)	224 (3.7)
Nonaccommodated						
Weighted percentage	1 (0.4)	2 (0.7)	7 (1.3)	8 (1.4)	39 (4.6)	43 (4.5)
Average score	*** (***)	*** (***)	214 (5.8)	222 (5.1)	230 (3.4)	226 (3.8)
Accommodated						
Weighted percentage	3 (***)	16 (9.9)	15 (6.1)	3 (1.8)	32 (12.8)	32 (11.7)
Average score	*** (***)	*** (***)	*** (***)	*** (***)	*** (***)	*** (***)
Instruction designed for LEP students						
Weighted percentage	12 (2.7)	3 (0.8)	8 (1.8)	8 (1.3)	28 (5.8)	41 (4.2)
Average score	238 (3.5)	*** (***)	203 (7.5)	223 (5.9)	225 (3.1)	224 (3.5)
Nonaccommodated						
Weighted percentage	12 (2.9)	3 (0.8)	7 (1.6)	8 (1.3)	29 (6.1)	41 (4.5)
Average score	238 (3.6)	*** (***)	210 (6.6)	224 (5.9)	226 (3.3)	226 (3.7)
Accommodated						
Weighted percentage	7 (***)	9 (3.5)	21 (14.5)	15 (5.8)	10 (4.1)	37 (10.6)
Average score	*** (***)	*** (***)	*** (***)	*** (***)	*** (***)	*** (***)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.

LEP = Limited-English-proficient students

(***) Standard error estimates cannot be accurately determined.

***(***) Sample size is insufficient to permit a reliable estimate

Note: Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.15—Data for Table 4.6 Percentage of students identified as LEP-only, and average reading scores, by language in which students are believed to best demonstrate reading ability, grades 4 and 8: 1998

	English	Spanish	Other	Information not available
Grade 4				
LEP-only				
Weighted percentage	52 (4.8)	12 (4.0)	1 (0.4)	34 (4.0)
Average score	179 (2.9)	160 (6.3)	*** (***)	171 (3.4)
Nonaccommodated				
Weighted percentage	55 (5.6)	13 (4.3)	1 (0.4)	31 (4.3)
Average score	179 (3.0)	159 (6.4)	*** (***)	173 (3.7)
Accommodated				
Weighted percentage	23 (8.1)	8 (4.9)	1 (***)	67 (9.7)
Average score	*** (***)	*** (***)	*** (***)	164 (7.3)
Grade 8				
LEP-only				
Weighted percentage	41 (3.7)	12 (2.1)	4 (1.0)	43 (4.4)
Average score	228 (2.1)	214 (5.8)	*** (***)	224 (3.6)
Nonaccommodated				
Weighted percentage	42 (4.0)	11 (2.1)	4 (1.0)	43 (4.5)
Average score	228 (2.3)	216 (5.7)	*** (***)	226 (3.7)
Accommodated				
Weighted percentage	33 (11.6)	19 (7.5)	5 (2.9)	43 (10.3)
Average score	*** (***)	*** (***)	*** (***)	*** (***)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.

LEP = Limited-English-proficient students

(***) Standard error estimates cannot be accurately determined.

***(***) Sample size is insufficient to permit a reliable estimate.

Note: Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Table D.16—Data for Table 4.7 Percentage of students identified as LEP-only, and average reading scores, by accommodation type, grades 4 and 8: 1998

	Large print test book	Extended time	Small group	One-on-one testing	Scribe/ computer	Other
Grade 4						
LEP-only						
Weighted percentage	# (***)	62 (11.7)	36 (11.5)	1 (0.7)	# (***)	1 (***)
Average score	*** (***)	171 (7.2)	*** (***)	*** (***)	*** (***)	*** (***)
Grade 8						
LEP-only						
Weighted percentage	3 (1.7)	87 (4.9)	8 (4.3)	2 (1.6)	0 (***)	0 (***)
Average score	*** (***)	202 (10.9)	*** (***)	*** (***)	0 (0.0)	0 (0.0)

NOTE: Standard errors of the estimated percentages and average scores appear in parentheses.

LEP = Limited-English-proficient students

(***) Standard error estimates cannot be accurately determined.

*** (***) Sample size is insufficient to permit a reliable estimate.

Percentage is between .0 and .5.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.