4. THE ACADEMIC PERFORMANCE OF SECONDARY SCHOOL STUDENTS WITH DISABILITIES

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There is no question that much is expected from our education system in terms of preparing future citizens, workers, and leaders. To that end, schools are expected to influence students' learning, socialization, and even vocational preparedness. This agenda is perhaps even more keenly applied for students with disabilities than for those in the general population. Indeed, NLTS2's conceptual framework reflects this comprehensive view of educationally relevant inputs and achievements both in and outside of school.

Despite the attention paid to a broad definition of outcomes, however, academic performance remains central. Academic instruction is arguably the primary business of education, and it was poor performance that spawned the recent era of reform after the publication of *A Nation at Risk* two decades ago (U. S. Department of Education, 1983). Further, it is academic performance that is central to the efforts of the *No Child Left Behind Act of 2001* to make schools and school districts accountable for assessing and improving student performance annually (Linn, Baker, & Betebenner, 2002). Further, limitations in academic achievement represent the primary implication of disability for most students receiving special education services, and those limitations, if left unaddressed, constrain their ability to pursue postsecondary education and well-paid employment after high school.

Although the importance of academic achievement is rarely questioned, reaching unanimity regarding its measurement has been elusive. The measurement of academic performance, particularly for students with disabilities, continues to be a controversial topic among policy-makers, measurement experts, and educators (Ahearn, 2000; Elliott, 1998; Johnson, 2000; Koretz & Hamilton, 1999; McGrew, Vanderwood, Thurlow, & Ysseldyke, 1995). Measuring academic performance can occur at multiple levels and serves multiple purposes. For example, classroom teachers often conduct formative and summative tests to evaluate student mastery of course content and provide grades for students and parents. State tests are designed primarily to measure progress at the school or school district level. In particular, graduation tests are used to determine whether a student has mastered the minimum content and competencies required to receive a high school diploma. Each of these kinds of assessments engenders significant questions related to test design, types of decisions supported by the results, alternative assessments, and accommodations (Heubert & Hauser, 1999; Minnema, Thurlow, Bielinski, & Scott, 2001).

Although this is a time of change in the educational arena, within this evolving accountability environment, it is crucial to understand the progress of all students, including those with disabilities, and the factors that contribute to their positive academic performance. NLTS2 is in a unique position to provide a national perspective on these issues. This chapter presents both descriptive findings and multivariate analyses of multiple measures of academic performance. It also compares results of the multivariate analyses with those achieved in similar analyses as part of the original NLTS.

Indicators of Students' Academic Performance

Teachers' Perceptions of Students' Academic Performance

NLTS2 considers two indicators of the views teachers have of the academic performance of students with disabilities: course grades and the perceptions of teachers in general education academic classes of how well students with disabilities "keep up" with the class as a whole.

Course grades. Although performance on standardized tests receives the greatest attention in discussions of students' academic performance, teachers' evaluations of performance as indicated in course grades represent a common metric of student performance that often is more directly tied to the day-to-day business of teaching and learning than are annual standardized test scores. Grades serve a number of important functions. They communicate to students and parents information about students' mastery of course content. In high school, a passing grade also is the criterion for a course's contributing to accumulated credit for graduation. Finally, grades provide information for consideration in college admissions (Polloway et al., 1994).

However, as a measure of academic performance, teacher-given grades have well-known limitations. Grades are composite measures that account not only for students' content mastery but often for other factors, such as their class participation, attitudes, progress over time, and attendance. Both general and special educators are known to consider these various factors when grading, but to emphasize different factors. For example, special education teachers are less likely than general educators to consider homework or attendance to be important in grading student performance, but are more likely to consider in-class participation to be important (Blackorby, Wagner, Levine, Cameto, & Guzman, 2003). Moreover, substantial variations in grading practices occur across teachers, schools, and school districts. Despite these complicating factors, student grades still are an important indicator within the academic performance outcome domain for students with disabilities because they indicate success by a teacher's standards and success relative to other students in a given classroom.

Good grades are common for many students with disabilities (Exhibit 4-1). Almost one-third (30%) of secondary school students with disabilities reportedly receive grades characterized as "mostly As and Bs."[1] In contrast, 8% of students with disabilities receive "mostly Ds and Fs." Seeing these results on report cards, most could reasonably conclude that many students with disabilities are making at least adequate progress and that failure to meet academic standards is comparatively uncommon.

Keeping up in general education academic classes. According to their teachers, virtually all students with disabilities who take academic courses in general education academic classes are expected to "keep up" with the assignments and grading expectations of the class. In reality, about three-fourths of them are perceived by teachers as successful in keeping up, with 26% of students with disabilities failing to meet teachers' expectations in general education academic classes.

[1] Please see Appendix A for details on the measurement of students' grades in Wave 1. Subsequent waves of NLTS2 will use information from students' transcripts to calculate grade point average—a more precise measure of students' overall grades.

Exhibit 4-1
TEACHERS' PERCEPTIONS OF THE ACADEMIC PERFORMANCE OF STUDENTS WITH DISABILITIES

	Percentage	Standard Error
Students whose grades are mostly:		
As and Bs	30.2	.2
Ds and Fs	8.4	.2
Students are expected to keep up in general education academic classes	97.4	1.0
Students who do keep up in general education academic classes	74.4	2.4

Source: NLTS2 Wave 1 parent interviews and students' school program survey.

Reading and Mathematics Performance

In addition to grades, students with and without disabilities are assessed in core academic subjects by using standardized achievement tests. Although they vary in their implementation across states and schools, they all address the core areas of reading and mathematics, and because their results can typically be reported with reference to a population norm, they provide a way to evaluate the progress in the curriculum of students with disabilities compared with that of peers without disabilities (Thurlow & Johnson, 2000; Thurlow, Nelson, Teelucksingh, & Ysseldyke, 2000). When compared with the expected performance for a particular grade level, test results provide a framework for understanding the match or mismatch between expected performance and students' actual proficiency.

NLTS2 data permit calculation of a measure of the deviation between the actual grade level of students with disabilities and the grade-level equivalent of their tested performance in reading and mathematics. School staff reported students' grade-level equivalent performance in reading and mathematics from their most recent assessment and the year of that assessment. When students' tested grade levels are compared with their actual grade level in that same year, the difference indicates how far ahead of or behind their actual grade level they function.

Exhibit 4-2
DISCREPANCY BETWEEN TESTED AND ACTUAL GRADE LEVELS IN READING AND MATHEMATICS OF STUDENTS WITH DISABILITIES

	Reading	Mathematics
Mean grade-level discrepancy between students' tested and actual grade levels	-3.6 (.2)	-3.6 (.2)
Percentage of students whose abilities are:		
Above grade level, at grade level, or less than 1 grade level behind	12.4 (1.7)	12.8 (1.8)
1 to 2.9 grade levels behind	20.9 (2.1)	20.7 (2.2)
3 to 4.9 grade levels behind	40.8 (2.6)	40.2 (2.7)
5 or more grade levels behind	26.0 (2.3)	26.4 (2.3)

Source: NLTS2 Wave 1 students' school program survey.

Standard errors are in parentheses.

In contrast to grades, which suggest that most students with disabilities make at least adequate progress, comparison of teacher-reported standardized test performance with students' actual grade level reveals that students with disabilities are an average of 3.6 years behind expected performance for their grade level in both reading and mathematics (Exhibit 4-2). In both subjects, only about one in eight students with disabilities are at grade level, above grade level, or less than one grade level behind. Another fifth are 1 to 2.9 grade levels behind, two-fifths are 3 to 4.9 grade levels

behind, and one-fourth are five or more grade levels behind. These figures are virtually the same as the discrepancies found for secondary-school-age students with disabilities in NLTS (Wagner, Blackorby, & Hebbeler, 1993). Particularly at the secondary level, achievement gaps of this size are likely to have significant implications for students' abilities to tackle the complex academic content called for by most state standards.

Relationships among Dimensions of Academic Performance

The two measures of teachers' perceptions of student performance—teacher reports that students keep up with the class and student grades—are moderately associated (Exhibit 4-3, r=.34). The gaps between test performance and grade level in reading and mathematics are quite strongly associated (r=.75). However, the correlations between teachers' perceptions and tested measures of academic performance are weak; in the case of grades, they are almost zero. Further regardless of how great the gap between students' tested reading ability and their actual grade level, between 71% and 83% of general education academic teachers indicate that students are keeping up with the class.

Exhibit 4-3
CORRELATIONS AMONG INDICATORS OF ACADEMIC PERFORMANCE OF YOUTH WITH DISABILITIES

	Grades	Tested Reading Performance Compared with Grade Level	Tested Mathematics Performance Compared with Grade Level
Keeps up with the class	.34 (<.0001)	.09 (<.0001)	.13 (<.0001)
Grades		.00 (.9094)	-.01 (.4981)
Tested reading performance compared with grade level			.75 (<.0001)

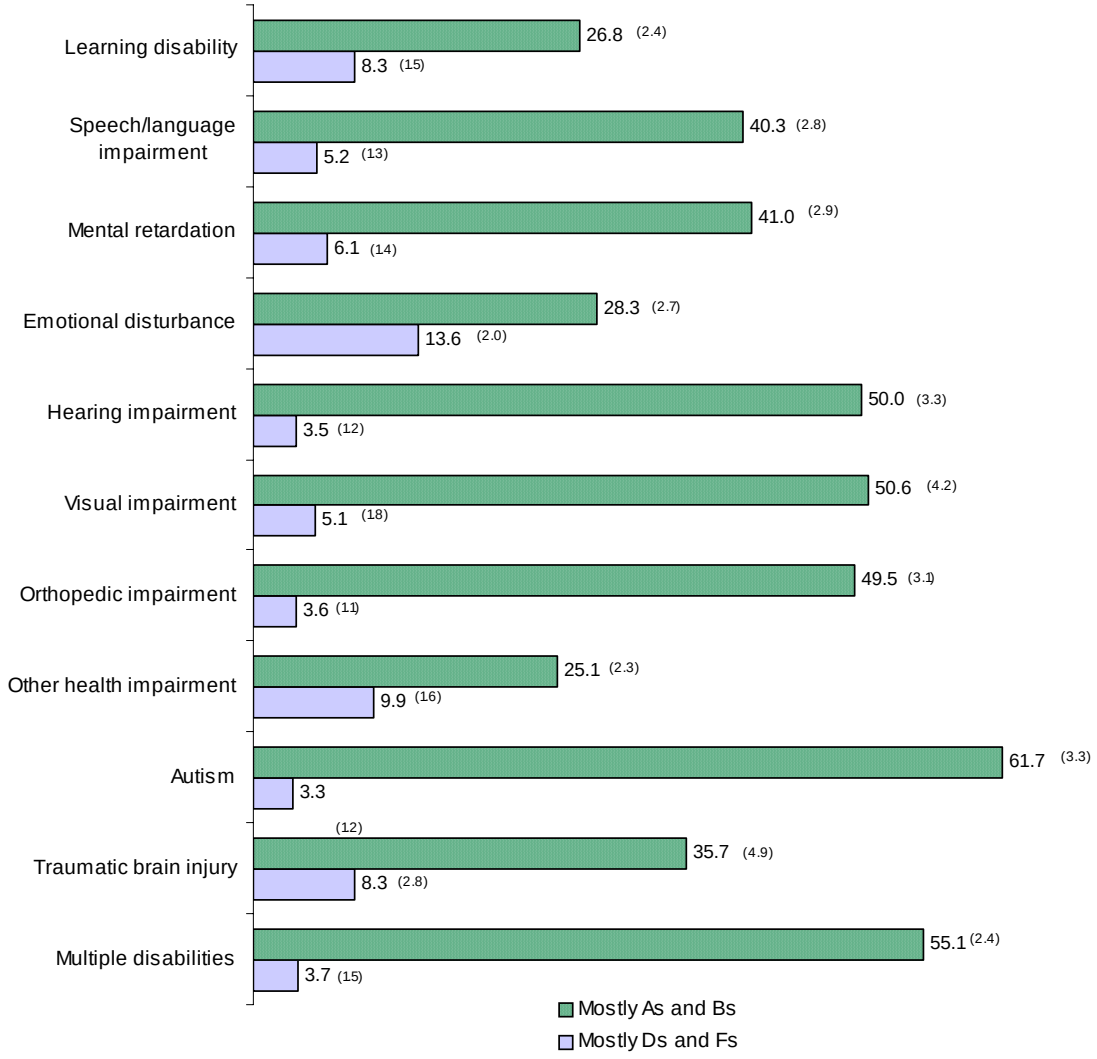
Significance levels are in parentheses.

Disability Differences in Students' Academic Performance

Teachers' Perceptions of Students' Academic Performance

High grades are common for youth in many disability categories. About half or more of students with hearing, visual, or orthopedic impairments, autism, or multiple disabilities receive "mostly As and Bs" (Exhibit 4-4). However, at least 25% of students in all other disability categories also receive these high grades, including students whose disabilities are clearly cognitive. For example, both learning disabilities and mental retardation involve cognitive learning challenges, with mental retardation commonly considered a more pervasive disability. Yet significantly more students with mental retardation receive high grades than students with learning disabilities (41% vs. 27%, p<.01). These simple bivariate findings illustrate the comingling of disability and instructional setting. For example, youth with mental retardation not only arguably have a more pervasive cognitive impairment than youth with learning disabilities, but that impairment results in their spending much less of their school day in general education academic classes compared with students with learning disabilities (i.e., 31% of students with learning disabilities take all classes in a general education setting, as do 7% of students with mental retardation, p<.001). The general education academic classes frequented more often by students with learning disabilities also may have different standards for grading than special education classes do. Multivariate analyses are needed to disentangle these kinds of complex relationships.

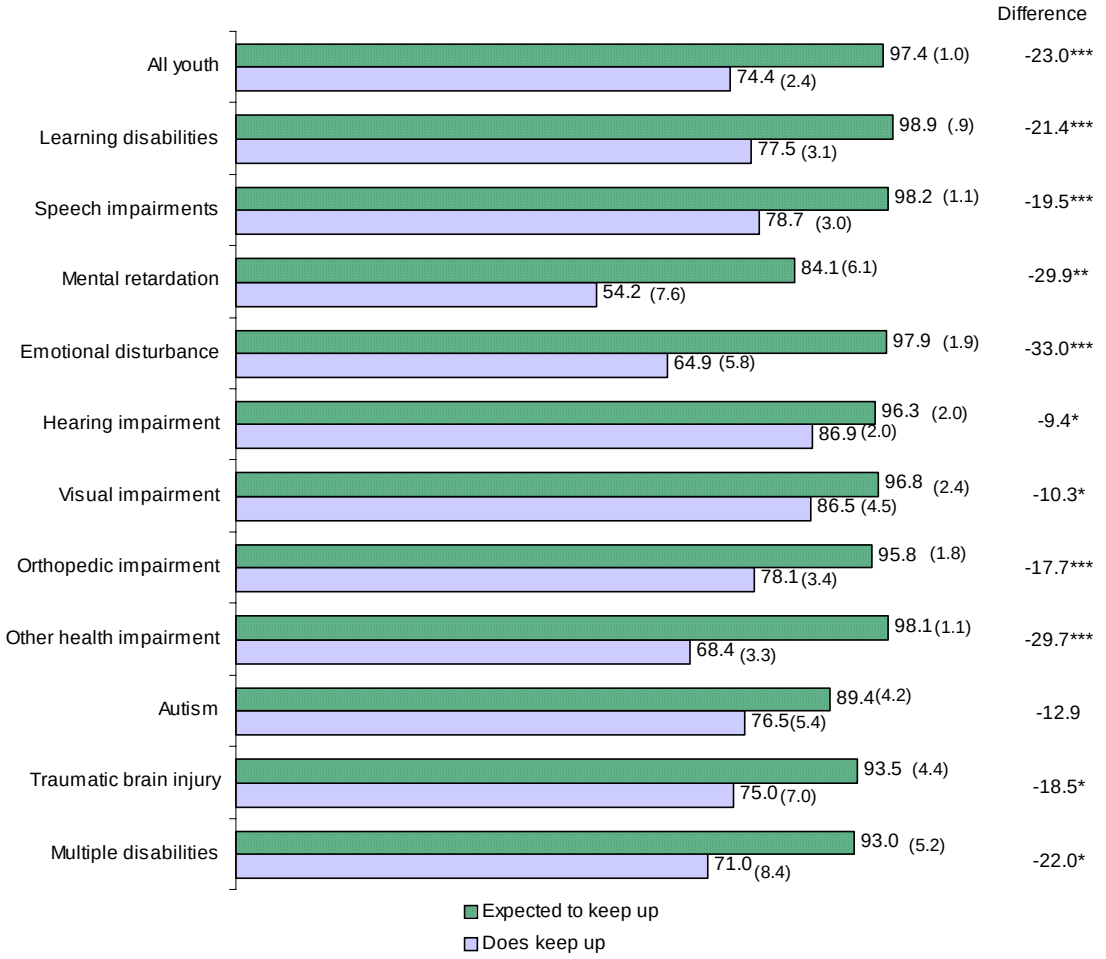
Exhibit 4-4
STUDENTS' GRADES, BY DISABILITY CATEGORY



Note: There are too few youth with deaf-blindness who receive grades to report separately.
Standard errors are in parentheses.

Keeping up in general education academic classes. Teachers' expectations for students to keep up do not differ much across disability categories, with the exception of youth with mental retardation; 84% of students with mental retardation who are in general education academic classes are expected to keep up in them (Exhibit 4-5; $p<.001$ compared with youth with learning disabilities). However, youth with disabilities differ more in their success in meeting teachers' expectations. Whereas about 75% or more of youth in most categories keep up in class and 87% of youth with hearing or visual impairments do, rates are 54% for youth with mental retardation and 65% for those with emotional disturbances ($p<.001$ compared with youth with learning disabilities).

Exhibit 4-5
TEACHERS' REPORTS OF STUDENTS' ABILITY TO KEEP UP IN GENERAL EDUCATION ACADEMIC CLASSES, BY DISABILITY CATEGORY



*=p<.05, **=p<.01, ***=p<.001
Note: There are too few youth with deaf-blindness in general education academic classes to report separately.
Standard errors are in parentheses.

Reading and Mathematics Performance

Sizable gaps between tested and actual grade levels in reading and mathematics are evident for students in all disability categories (Exhibit 4-6). Students in most categories have equally large gaps in performance in the two subject areas; differences between performance levels in the two subject areas are not significant for any group.

Not surprisingly, given the lack of relationship between grades and actual reading and mathematics performance, the relative rankings of the various disability categories on the measures differ. Although students with visual impairments have among the highest grades and are among the least behind, particularly in reading, other categories of students with disabilities who have relatively high grades are actually quite far behind grade level in reading and

Exhibit 4-6
DISCREPANCY BETWEEN TESTED AND ACTUAL GRADE LEVELS IN READING AND MATHEMATICS, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impairment	Mental Retardation	Emotional Disturbance	Hearing Impairment	Visual Impairment	Orthopedic Impairment	Other Health Impairment	Autism	Traumatic Brain Injury	Multiple Disabilities	Deaf-Blindness
Reading												
Mean discrepancy in years between tested and actual grade level	-3.4 (.2)	-3.2 (.3)	-6.3 (.2)	-2.2 (.3)	-3.6 (.3)	-2.6 (.4)	-2.8 (.3)	-2.4 (.2)	-4.2 (.4)	-4.6 (.5)	-5.8 (.3)	-5.3 (.6)
Percentage of students whose test scores are:												
Above grade level, at grade level, or less than 1 grade level behind	10.8 (2.3)	13.1 (3.3)	0.5 (0.6)	28.6 (4.8)	19.4 (3.9)	28.5 (6.4)	29.5 (4.3)	25.1 (3.6)	18.8 (4.1)	8.7 (4.5)	3.6 (2.2)	12.6 (6.1)
1 to 2.9 grade levels behind	23.3 (3.2)	24.0 (4.2)	2.7 (1.3)	25.6 (4.7)	13.1 (3.4)	20.2 (5.7)	20.4 (3.8)	28.4 (3.7)	11.4 (3.3)	16.8 (6.0)	5.8 (2.7)	6.2 (4.4)
3 to 4.9 grade levels behind	45.1 (3.7)	42.8 (4.8)	32.4 (3.9)	31.3 (4.9)	34.9 (4.8)	36.2 (6.8)	25.4 (4.1)	30.7 (3.8)	25.9 (4.6)	26.9 (7.1)	33.0 (5.5)	25.6 (8.0)
5 or more grade levels behind	20.8 (3.1)	20.0 (3.9)	64.4 (3.9)	14.5 (3.8)	32.6 (4.7)	15.2 (5.1)	24.7 (4.1)	15.8 (3.0)	44.0 (5.2)	47.6 (8.0)	57.6 (5.7)	55.7 (9.1)
Mathematics												
Mean discrepancy in years between tested and actual level	-3.2 (0.2)	-3.4 (0.3)	-6.1 (0.2)	-2.9 (0.3)	-3.0 (0.3)	-2.7 (0.4)	-3.4 (0.3)	-2.9 (0.2)	-4.9 (0.4)	-4.4 (0.5)	-5.9 (0.3)	-4.6 (0.7)
Percentage of students whose test scores are:												
Above grade level, at grade level, or less than 1 grade level behind	13.6 (2.7)	15.2 (3.6)	2.4 (1.3)	14.7 (3.8)	21.7 (4.4)	24.4 (5.9)	23.6 (4.2)	20.1 (3.4)	13.4 (3.7)	9.6 (4.8)	3.2 (2.1)	17.3 (7.6)
1 to 2.9 grade levels behind	22.8 (3.3)	16.6 (3.7)	4.6 (1.8)	29.0 (4.9)	17.6 (4.1)	26.8 (6.1)	16.0 (3.6)	23.7 (3.6)	9.8 (3.2)	13.7 (5.6)	6.8 (3.1)	15.2 (7.2)
3 to 4.9 grade levels behind	43.9 (4.0)	50.4 (5.0)	24.8 (3.6)	37.0 (5.2)	37.8 (5.2)	29.3 (6.3)	28.2 (4.4)	37.7 (4.1)	24.8 (4.7)	35.4 (7.8)	35.0 (5.8)	23.2 (8.5)
5 or more grade levels behind	19.7 (3.2)	17.8 (3.8)	68.3 (3.9)	19.3 (4.2)	22.9 (4.5)	19.5 (5.5)	32.2 (4.6)	18.5 (3.3)	52.0 (5.4)	41.3 (8.1)	54.9 (6.0)	44.3 (10.0)

Source: NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

mathematics skills. For example, students with autism are the most likely of all categories to have "mostly As and Bs" given by their teachers, yet, on average, they are 4 years behind grade level in reading and almost 5 years behind in mathematics. In contrast, students with emotional disturbances or other health impairments are more likely to receive low grades than peers in

other disability categories but are closer to grade level in reading than any other category of youth with disabilities.

Factors Associated with Academic Performance

To explore the independent associations between academic performance and disability and other individual and family characteristics, as well as school programs and experiences, three multivariate models of academic performance were estimated. Dependent variables include:

- Grades—a 9-point scale ranging from "mostly As" and "mostly As and Bs" to "mostly Ds and Fs" and "mostly Fs."
- Tested reading performance compared with grade level—positive values indicate higher test scores relative to actual grade level; negative values indicate lower test scores relative to actual grade level.
- Tested mathematics performance compared with grade level—positive values indicate higher test scores relative to actual grade level; negative values indicate lower test scores relative to actual grade level.

Individual Characteristics

Disability characteristics. As the descriptive results suggest, disability category is a significant factor in explaining variations in both grades and skill discrepancies. Controlling for other factors, students with mental retardation, autism, traumatic brain injury, or multiple disabilities all have significantly higher grades than peers with learning disabilities (Exhibit 4-9). The fact that students with mental retardation also have significantly greater academic deficits than students with learning disabilities reinforces the notion that factors other than academic performance are taken into account when teachers give grades. In addition, students with these disabilities also spend a greater part of their school day in special education classes, in which grading standards can differ from those in general education classes. Although this difference in students' school programs is controlled for in the analysis, other program differences may still come into play in accounting for variation in grades. Independent of primary disability category, students who are reported to have attention deficit or attention deficit/hyperactivity disorder (ADD/ADHD) receive lower grades than do students whose disability profiles do not contain that disorder.

The analysis of the number of grade levels that students are behind in reading shows a different set of disability characteristics to be most relevant. Students with emotional disturbances or visual or orthopedic impairments are between 1 and 2.4 years closer to grade level than students with learning disabilities. Students with other health impairments and autism also are less behind in reading than their peers with learning disabilities but by less than 1 grade level. There are fewer disability-related differences with respect to mathematics than for reading performance. Only students with hearing or visual impairments out perform students with learning disabilities, the comparison group. Students with visual or hearing impairments are 1.5 and .4 years closer to grade level in mathematics than students with learning disabilities, other factors held constant. With the exception of students with mental retardation, most of the other groups' performance is similar to that of students with learning disabilities.

Exhibit 4-7
DIFFERENCES IN ACADEMIC PERFORMANCE ASSOCIATED WITH INDIVIDUAL CHARACTERISTICS OF YOUTH WITH DISABILITIES[a]

	Estimated Difference in:			
	Grades[b]	Tested Reading Performance Compared with Grade Level	Tested Mathematics Performance Compared with Grade Level	For Increment
Disability Characteristics				
Youth classified with:	.1	.0	-.3	vs. learning disability[c]
Speech/language impairment	.1	.0	-.3	vs. learning disability
Mental retardation	**.5*** **	**-.7*** **	**-.7*** **	vs. learning disability
Emotional disturbance	-.1	**1.1*** **	.2	vs. learning disability
Hearing impairment	.2	.0	**.4***	vs. learning disability
Visual impairment	.1	**2.4*** **	**1.5*** **	vs. learning disability
Orthopedic impairment	.2	**1.1*** **	.2	vs. learning disability
Other health impairment	-.0	**.7*** **	.1	vs. learning disability
Autism	**.9*** **	**.7*** **	-.2	vs. learning disability
Traumatic brain injury	**.3***	.2	.0	vs. learning disability
Multiple disabilities/deaf-blindness	**.5*** **	-.3	-.4	vs. learning disability
ADD/ADHD[d]	**-.2****	.2	.1	Yes vs. no
Age at identification	**-.2*** **	.1	.1	8 vs. 4 years
Number of problem domains	.0	**-.3*** **	-.1	3 vs. 1 domains
Functioning				
Self-care skills	**-.8*** **	.1	.3	High vs. low (8 vs. 4)
Functional cognitive skills	**-.2***	**1.6*** **	**1.8*** **	High vs. low (15 vs. 7)
Social skills	**.3*** **	**-.8*** **	-.3	High vs. low (27 vs. 17)
Persistence	**1.0*** **	-.1	-.3	Well vs. not at all well (3 vs. 1)
Demographics				
Age	.0	**-1.5*** **	**-.7*** **	17 vs. 14 years
Gender	**-.3*** **	**-.2***	**.3****	Male vs. female
African American	**-.2****	**-.7*** **	**-.9*** **	vs. white
Hispanic	-.0	**-.5****	**-.5****	vs. white
Other or multiple race/ethnicity	.1	**-.8****	**-.6**	vs. white
Primarily language other than English spoken at home	.0	**-.4****	-.1	Yes vs. no

[a] Statistics in this exhibit are calculated from models that include all individual characteristics shown in this exhibit, as well as household characteristics (results shown in Exhibit 4-8) and school programs and experiences (results shown in Exhibit 4-9).

[b] Grades are measured on a 9-point scale, ranging from "mostly As" and" mostly As and Bs" to "mostly Ds and Fs" and "mostly Fs."

[c] Multivariate analyses require that for categorical variables, such as disability category, each category be compared with another specified category. Learning disability was chosen as the category against which to compare the relationships for other disabilities because it is the largest disability category and, therefore, most closely resembles the characteristics of students with disabilities as a whole.

[d] ADD/ADHD is included to determine its relationships as a primary or secondary disability to academic performance, independent of youth's primary disability category.

*p<.05; **p<.01; ***p<.001.

Exhibit reads: In a school year, the grades of youth with autism are .9 point higher on a 9-point scale than the grades of youth with learning disabilities, other factors being equal. The reading test scores of boys are .3 year farther behind their grade level than the reading test scores of girls. The mathematics test scores of youth whose functional cognitive skills are high are 1.8 years closer to their actual grade level than those of youth whose functional cognitive skills are low.

Independent of the nature of a youth's disability, youth whose disabilities are detected at an earlier age are more likely to receive lower grades, but this proxy for the severity of disability is unrelated to actual academic skills. With respect to the number of domains in which youth experience limitations, youth whose disabilities result in limitations in more areas of functioning are more likely to be below grade level in reading than those with fewer limitations, although a similar relationship is not noted for mathematics skills or grades.

Functioning. All of the aspects of functioning included in the analyses are associated with some indicator of academic performance—most consistently with grades. Functional cognitive skills have the widest impact on academic performance of the measures of functioning examined in NLTS2. Somewhat surprisingly, youth with higher cognitive skills receive somewhat lower grades, even when differences in school programs and placements are accounted for. However, more in keeping with expectations, compared with youth with low levels of functional cognitive skills, youth with high functional cognitive skills levels are 1.6 and 1.8 years closer to grade level in reading and mathematics, respectively.

Ratings of social skills also are related strongly to both grades and academic skills, but the direction of relationships is opposite that for cognitive skills. Youth rated with high social skills receive significantly higher grades than their socially less adept peers, but they perform at a lower grade level in reading. Both self-care skills and persistence are related to students' grades, but not to their actual academic skills; however, the relationships go in opposite directions. Youth who are reported to have greater persistence in completing tasks (perhaps including homework) receive higher grades than less persistent youth do, as expected. However, higher self-care skills are associated with lower grades, independent of other differences among youth.

Demographics. Many studies have demonstrated a strong and consistent relationship between students' demographic characteristics and academic success. For example, African-American students in the general population tend to receive lower scores in reading and mathematics than white students (National Center for Education Statistics, 2002). In NLTS2 multivariate analyses, age, gender, race/ethnicity, and using a language other than English at home all are related significantly to students' academic performance.

Older youth are significantly behind grade level in both reading and mathematics, compared with younger peers, suggesting that students with disabilities continue to lose ground relative to grade-level expectations as they progress through school. With regard to gender, young women with disabilities receive higher grades than their male peers, independent of other factors, but perform at a slightly lower grade level in mathematics—a pattern also noted in the general population (National Center for Education Statistics, 2002). All racial/ethnic groups are more behind in reading and mathematics than white students. African-American students with disabilities also receive lower grades than white students, independent of other differences between groups. Finally, using a language other than English at home is related to a somewhat lower grade level performance in reading, although no relationship is noted with either mathematics abilities or grades.

Household Characteristics

NLTS2 multivariate analyses show that household income and parental support and expectations are related to student performance. Coming from a household with a higher income is associated both with receiving higher grades from teachers and being closer to grade level in

reading and mathematics abilities (Exhibit 4-8). Parents' expectations for the academic futures of their adolescent children with disabilities also are consistently related to academic performance. Students with disabilities whose parents have higher expectations for postsecondary education receive higher grades and have reading and mathematics test scores that are a year closer to grade level than those for youth whose parents have lower postsecondary education expectations, independent of other disability, demographic, or school program factors included in the analyses.

Two scales of family involvement show different patterns of relationships with the indicators of academic performance. Greater family involvement at home is related to youth's receiving lower grades, perhaps reflecting the tendency of parents to provide homework help to lower-performing students—an important aspect of parents' involvement at home. In contrast, youth whose families are involved more at school receive higher grades and are significantly closer to their measured grade level in reading.

Exhibit 4-8
DIFFERENCES IN ACADEMIC PERFORMANCE ASSOCIATED WITH HOUSEHOLD CHARACTERISTICS OF YOUTH WITH DISABILITIES[a]

	Estimated Difference in:			
	Grades[b]	Tested Reading Performance Compared with Grade Level	Tested Mathematics Performance Compared with Grade Level	For Increment
Household income	**.1****	**.3*****	**.2***	$55,000 to $60,000 vs. $20,000 to $24,000 (12 vs. 5)
Expectations for postsecondary education	**.7*****	**1.0*****	**1.0*****	Definitely will vs. probably won't (4 vs. 2)
Family involvement at home	**-.2****	-.1	-2	High vs. low (8 vs. 4)
Family involvement at school	**.1****	**.3****	.2	High vs. low (6 vs. 1)

[a] Statistics in this exhibit are calculated from models that included the household characteristics shown in this exhibit, as well as individual characteristics (results shown in Exhibit 4-7) and school programs and experiences (results shown in Exhibit 4-9).

[b] Grades were measured on a 9-point scale, ranging from "mostly As", and "mostly As and Bs" to "mostly Ds and Fs" and "mostly Fs." See Chapter 1 for further details.

*p<.05; **p<.01; ***p<.001.

Exhibit reads: In a school year, the grades of youth with household incomes of $55,000 to $60,000 are .1 point higher on a 9-point scale than the grades of youth with household incomes of $20,000 to $24,000. The reading test scores of youth with household incomes of $55,000 to $60,000 are .3 of a grade less behind their actual grade level than the reading test scores of youth with household incomes of $20,000 to $24,000.

School Programs and Experiences

The final set of variables included in these analyses relate to school programs and other school experiences. It is arguably most important to understand the relationships of this set of factors to academic performance because it includes factors that are amenable to change in schools and classrooms and that can have direct effects on students.

School programs. Participation in general academic education classes by students with disabilities has increased over the past decades, but research conclusions regarding the

instructional efficacy of that participation are mixed. Although participation in general academic education classes can relate to greater learning, it also has been shown to carry with it a greater risk for course failure because of the potential for higher academic expectations in general education relative to special education classes. NLTS2 analyses confirm this tension between learning and grades (Exhibit 4-9). Students with disabilities who take more of their classes in general academic education settings receive somewhat lower grades overall, but also are closer to grade level in both reading and mathematics than peers who take fewer classes in those settings. Comparing youth who take three-fourths of their courses in general academic education with those who take only one-fourth of their courses there, reading and mathematics scores for the former are more than a full year closer to grade level. These relationships for general academic education participation are present even when the analyses control for disability, functioning, demographics, and family support—all factors that correlate with placement (Wagner, 1991c).

Exhibit 4-9
DIFFERENCES IN ACADEMIC PERFORMANCE ASSOCIATED WITH SCHOOL PROGRAMS AND EXPERIENCES OF YOUTH WITH DISABILITIES[a]

	Estimated Difference in:			
	Grades[b]	Tested Reading Performance Compared with Grade Level	Tested Mathematics Performance Compared with Grade Level	For Increment
School programs				
Percentage of classes in general education	**-.2*** **	**1.3*** **	**1.1*** **	75% vs. 25% of classes
Participation in vocational education	.1	NA	NA	Yes vs. no
Class size	.0	**.2****	**.2****	22 vs. 10 students
Help from a tutor	.1	.1	-.1	Yes vs. no
Number of instructional and testing accommodations	-.1	**-1.0*** **	**-.9*** **	Some vs. none (5 vs. 0)
Number of presentation/ communication accommodations	-.1	.1	.1	Some vs. none (2 vs. 0)
School experiences				
Absenteeism	**-.2*** **	.1	**-.2***	5 days vs. none
Declassification from special education	**.4****	.6	.4	Yes vs. no
School mobility other than for grade level changes	-.1	.2	.1	Three changes vs. none

[a] Statistics in this exhibit are calculated from models that included the characteristics shown in this exhibit, as well as individual characteristics (results shown in Exhibit 4-7), and household characteristics (results shown in Exhibit 4-8).

[b] Grades were measured on a 9-point scale, ranging from "mostly As", and "mostly As and Bs" to "mostly Ds and Fs" and "mostly Fs."

*p<.05; **p<.01; ***p<.001.

Exhibit reads: In a school year, the grades of youth who take 75% of their courses in general education classes are .2 points lower on a 9-point scale than students who take 25% of their courses in general education classes, other factors being equal.

NLTS2 analyses indicate that students' performance gaps in reading and math are smaller in larger classes. This relationship may result from factors that are not controlled in the model. For

example, as mentioned regarding the finding that students with mental retardation receive better grades than those with learning disabilities, despite being much farther behind in actual academic ability, the analyses may not adequately control for differences in general education and special education settings. General education classes are significantly larger than special education classes (Newman, Marder, & Wagner, 2003; Levine & Wagner, 2003) and also tend to include students with stronger academic skills. Alternatively, students in larger classes may have had smaller classes and/or more intensive support of other types in the past, so that they became able to be in larger classes and do well. Future NLTS2 longitudinal analyses will be able to examine the impact of current class size on later performance to help illuminate this issue.

Other NLTS2 findings further illustrate the challenge of identifying the impacts of services, accommodations, and supports for students with disabilities by using data gathered at a single point in time. Students who receive some kinds of instructional accommodations often do so because they have lower levels of achievement. Therefore, although the accommodation may assist a student in raising performance over time, it may not lift his or her performance in a given year to the level of a student who did not need it. This situation would result in analyses showing a negative relationship between receiving accommodations and academic performance, as is found in NLTS2 analyses. For example, youth who receive a total of five instructional or testing accommodations (e.g., more time for assignments or tests, shorter assignments, modified grading standards) are nearly 1 year farther behind in both reading and mathematics than peers who receive (and presumably need) no accommodations, other factors held constant.

However, this principle does not appear to apply equally to all types of accommodations or supports. In contrast to findings for instructional and testing accommodations, youth receiving presentation or communication accommodations (e.g., help from a reader or interpreter, books on tape, communication aids) do not achieve at significantly different reading or mathematics grade levels than students who do not receive such accommodations, other things being equal. The receipt of tutoring also has no significant relationship to grades or reading and mathematics grade levels. Perhaps the effect of tutoring is not so much to help youth receiving it outperform their peers but to keep them from falling behind.

School experiences. When students miss class, they also miss the opportunity to access new curriculum content, ask questions, or generally participate in class activities, and those missed opportunities adversely affect learning. NLTS2 multivariate models support this perspective. Students who are absent for 5 days or more in a month both receive lower grades and are farther behind in mathematics (but not in reading) than those who have perfect attendance, other things being equal. It is logical that absenteeism has a direct effect on grades and only an indirect and modest effect on grade-level discrepancies in reading and mathematics, in part because teachers frequently consider attendance and participation in grading students.

Youth who have been declassified from special education receive better grades than those who continue to receive special education. On the other hand, the gaps between performance on standardized tests and actual grade level do not differ between students who have been declassified and those who have not. Contrary to expectations, student mobility is not directly related to any of the measures of academic performance. However, it may indirectly contribute to poorer performance through its relationship to higher absenteeism, as noted in Chapter 3.

How Much Is Explained?

The amount of variation in grade-level discrepancies (r^2) explained by the factors discussed in this section increases substantially as each set of factors is considered. Disability and functioning alone account for 22% of the variation in grade-level discrepancies, whereas all factors combined account for 51% of the variation. In contrast, the individual characteristics associated with disability and functioning explain approximately 20% of the variation in student grades; other factors add very little explanatory power to the model.

Looking Back to NLTS

Although the aspects of academic performance that are assessed in this chapter—grades and discrepancies between tested and actual reading and mathematics grade levels—were not subject to multivariate analyses in NLTS, that study did examine the relationships of aspects of students' individual, household, and school program characteristics with whether students failed courses—the ultimate outcome of poor grades. The NLTS2 analysis of students' grades and the NLTS analysis of course failure show several similarities in the factors found to relate to those aspects of academic performance. In both cases, students with visual, orthopedic, or other health impairments outperform those with learning disabilities. Patterns of relationships for demographic factors also are similar across the studies: gender relates to performance, favoring girls, as does minority status, favoring white students. Higher household income also consistently relates to better academic performance across the studies. NLTS and NLTS2 considered a substantially different set of school program factors in addressing academic performance, yet the relationship of the extent of inclusion in general education classrooms remains the same; other factors being equal, students with disabilities who spend more of their school day in general academic education classes receive lower grades and/or are more likely to fail courses than those who spend more time in special education settings.

Summary

Student academic performance is a more important outcome for education reform than ever before, and the move to improve that performance now specifically includes students with disabilities. The national look at academic performance of secondary school students with disabilities enabled by NLTS2 suggests that different indicators of performance offer divergent perspectives on the progress that students are making. Most students with disabilities receive passing or even exemplary grades, which might indicate successful accomplishment of curriculum goals. In addition, teachers of general education academic classes report that about three-fourths of students with disabilities keep up in those classes. However, significant numbers of students in all disability categories function sufficiently below grade level in reading and math to raise the question of their ability to complete high school work successfully. And the correlation between grades and academic functioning is nearly zero, indicating that the two are largely unrelated. This finding is consistent with the perspective that grades may reflect engagement and social factors in addition to classroom performance.

Individual, household, and school program factors all contribute significantly to students' academic performance, with the amount of variation explained in multivariate analyses increasing substantially with the addition of each set of factors. Although individual and household characteristics all bear on how well students do, choices made at the school level

regarding programs, services, and supports also are strongly related to student performance. What schools do can make a difference in the academic performance of students with disabilities.

Different sets of individual and demographic characteristics are related to grades than to performance in reading and math. Although students' primary disability category and severity play an important role in analyses of both kinds of indicators, different disabilities come into play. Controlling for other factors, students with sensory or orthopedic impairments or emotional disturbances are closer to grade level in reading or math than students with learning disabilities, but do not differ from those with learning disabilities in grades. In contrast, students with mental retardation, autism, traumatic brain injury, or multiple disabilities all of whom have higher grades than peers with learning disabilities. Further, students with higher cognitive skills perform closer to grade level in reading and math than do peers who have lower functional cognitive skills. Demographic and family background factors also are significantly related. African-American and Hispanic students, as well as those from low-income families, score significantly below white and higher-income peers, respectively, on most measures of academic performance.

NLTS2 multivariate analyses also show that the involvement and expectations of parents are consistently related to the academic outcomes that students achieve. Students whose parents expect their sons or daughters with disabilities to attend postsecondary education receive significantly higher grades and are closer to grade level in reading and math than peers whose parents do not hold those expectations. Similarly, students whose families are involved in school activities also have better performance as indicated by both types of performance measures.

School program factors, too, contribute importantly to understanding variations in student performance. For example, controlling for other factors, students who take three-quarters of their classes in general education settings and those who are in larger classes perform closer to grade level than do peers who spend just a quarter of their time in general education settings or in smaller classes. However, students who require and receive accommodations in instruction or testing are farther behind grade level in reading and math than peers who do not require or receive the accommodations, other factors held constant. This finding suggests that choices regarding settings, groupings, and supports sometimes relate to performance, but that determining the effectiveness of specific supports requires longitudinal analysis of the experiences of individual students, rather than analyses that compare the performance of those who receive supports at a given time with the performance of others without need of the service. Future NLTS2 analyses will be able to address these issues.