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CHANGES OVER TIME IN THE SECONDARY SCHOOL EXPERIENCES OF STUDENTS WITH DISABILITIES

A Report of Findings from the National Longitudinal Transition Study (NLTS) and the National Longitudinal Transition Study-2 (NLTS2)

Prepared for:
Office of Special Education Programs
U.S. Department of Education

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SRI International
333 Ravenswood Avenue Menlo Park, CA 94025

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Prepared by:
Mary Wagner, Lynn Newman, and Renée Cameto

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The research reported here spans almost a decade and a half and has commanded much of the intellectual energy of the authors and the NLTS and NLTS2 study teams for those years. It has been an investment made willingly and with confidence in the importance of the work.

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EXECUTIVE SUMMARY

The Individuals with Disabilities Education Act Amendments of 1997 (IDEA '97), the No Child Left Behind Act of 2001 (NCLB), and scores of state and local initiatives culminate nearly two decades of increasing emphasis on the improvement of American education centered on accountability, flexibility, and improved outcomes for students. Those efforts have had significant impacts on policy and practice at all levels of the education system, including a renewed focus on academics, evidence-based interventions, and achievement testing. This report explores how the school experiences of students who receive special education services in middle and high school may have evolved in response to these changes in policy and practice.

Two research projects sponsored by the Office of Special Education Programs (OSEP) of the U. S. Department of Education help address that topic by documenting changes in several key aspects of the secondary school experiences of students with disabilities over the period of about a decade and a half since the mid-1980s. The National Longitudinal Transition Study (NLTS) generated nationally representative information about secondary-school-age youth who were receiving special education services in 1985. To assess the status of youth with disabilities in the early 21st century, OSEP commissioned the National Longitudinal Transition Study-2 (NLTS2), which addresses many of the same issues as NLTS but extends its scope with additional data items and instruments.

Comparisons of findings for youth who were represented in NLTS with those for youth represented in NLTS2 illuminate changes in the following aspects of the school experiences of secondary students with disabilities:

- Characteristics of their schools, including the types of schools attended and the composition of their student bodies, selected school programs, the kinds of communities in which the schools were located, and the resources in them.
- Characteristics of their school programs, including courses taken, instructional settings, and related services provided to students with disabilities.
- School participation, including school attendance, academic performance (grades), and suspensions from school.

These aspects of students' secondary school experiences are addressed for NLTS students (cohort 1) with information from the first wave of school surveys and school record abstracts conducted for each student's most recent year in school, either the 1985-86 or 1986-87 school year. A mail survey of principals of the schools students with disabilities attended most recently asked respondents to report on the characteristics of their school and their student bodies, policies relevant to students with disabilities, staff and programmatic resources available in the school, and other resources available in the community surrounding the school. In addition, a school staff member was recruited to abstract information from each student's school record on courses taken in the school year and their instructional settings, related services received, and several measures of the student's school participation and performance.

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For NLTS2 students (cohort 2), data for this report are drawn from two mail surveys that were conducted with school staff in the spring of the 2001-02 school year. A school staff person who could report on the characteristics and policies of each school attended by an NLTS2 study member was asked to complete the school characteristics survey to provide information similar to that collected in NLTS. In addition, the staff person most knowledgeable about the overall school program of each individual student was surveyed to obtain information similar to that abstracted from the school records of cohort 1 students.

Comparative analyses include the age group of students for which school data were collected in Wave 1 of both studies: 14- through 18-year-olds.[1] This report highlights the extent and direction of change for this age group of youth with disabilities as a whole and for youth in the nine disability categories that were in use in both 1987 and 2001. Changes also are described for youth with disabilities who differed in their gender and grade level, the income of their households, and their racial/ethnic background, where significant.

The Changing School Environments of Students with Disabilities

The changes in the characteristics of schools attended by students with disabilities that are noted in this report reflect a variety of changes in special and general education policy and practice and in the demographics of the general school population.

- Over time, there was a significant, almost 4-percentage-point decrease in students with disabilities attending special schools that serve only students with disabilities. This drop from more than 6% to about 2.5% more than cut in half the percentage of students with disabilities who were attending special schools. There was a corresponding 3-percentage-point increase in their attending regular secondary schools.
- At the same time, schools attended by cohort 2 students with disabilities were much more likely to have self-contained special education classrooms as a placement option than had been true for cohort 1 students. The decision to create self-contained classrooms in regular secondary schools may have been in response to an influx of students with disabilities who would otherwise have gone to special schools and who were determined to need the kinds of instruction and supports that were possible in self-contained special education classrooms.
- The growth in Hispanic and Asian/Pacific Islander students in the national student population is borne out in similar changes in the student bodies of schools attended by secondary school students with disabilities. A substantial increase in students attending schools that provided ESL programs was one response to the burgeoning population of students both with and without disabilities who speak a language other than English.
- In contrast, there was an increase in students with disabilities attending schools with higher concentrations of students in poverty, but a substantial reduction in their schools' participation in the Title I compensatory education program.

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[1] The samples are weighted to have the same distribution of these age groups: 21% are 14, 22% are 15, 23% are 16, 32% are 17, and 2% are 18.

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- An increase in the suburban population nationally is reflected in a 21-percentage-point increase in students with disabilities attending schools in suburban communities.
- The average size of the schools students with disabilities attended increased, reflecting the move away from smaller, rural schools as well as the move away from smaller special schools that served only students with disabilities.
- The sizable shift to suburban communities may help explain a marked increase in the resources that reportedly were available in the communities surrounding those schools. There were significant increases in students attending schools in communities that had a variety of secondary and postsecondary education options (e.g., vocational-technical schools, alternative or continuation schools), supports for adult independence (e.g., group homes, centers for independent living, supported work facilities), and advocacy and support groups for persons with disabilities.

Changes in Students' School Programs

Students with disabilities have shown important changes in their school programs since the mid-1980s that may bode well for their future.

- Cohort 2 high school students with disabilities were much more likely than their cohort 1 counterparts to be taking core academic courses, including mathematics, science, social studies, and a foreign language.
- Increasingly, students with disabilities who were taking academic courses were doing so in general education classes. In the spring semester of the 2001-02 school year, seven in ten secondary school students with disabilities were taking at least one academic course in a general education class.
- Students with disabilities were increasingly likely to be attending schools that had policies of providing general education teachers who had students with disabilities in their classes in-service training on the needs of such students, a classroom aide for the teacher or for an individual student with a disability, a smaller class size, or special equipment or materials to use with students, in efforts to increase the chances students with disabilities would succeed in those classes.
- Thirty percent of cohort 2 students with disabilities were taking no special education classes at all in the spring of 2002, whereas only 9% of cohort 1 students with disabilities were not taking any special education courses in the 1985-85 or 1986-87 school years.
- This decline in overall special education course taking masks an increase in the likelihood that students with disabilities who were taking nonacademic courses were doing so in special education classes, largely as a result of life skills or study skills instruction increasingly being the purview of special education.

One apparent trade-off resulting from an increased emphasis on more rigorous academic course taking is that nonacademic courses, particularly vocational education, may be getting pushed out of the course schedules of many students with disabilities. Vocational course taking declined overall by 7 percentage points, so that only about six in ten cohort 2 students with disabilities were taking it in spring 2002. Also, cohort 2 students with disabilities who were

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taking vocational education were more likely than cohort 1 students to be doing so in a special education class. Students with learning disabilities or speech impairments had among the largest declines in vocational course taking (11 and 10 percentage points), yet these are the categories of youth for whom the benefits of vocational education were shown to be strongest in NLTS in terms of postsecondary vocational training and competitive employment (Wagner et al, 1993) At the same time, these are the students who showed substantial increases in enrollment in academic courses, which may prepare them to enroll in postsecondary education at higher rates than were apparent at the time of NLTS.

In addition to courses and instructional settings, related services can be an important part of the educational programs of many students with disabilities. Several kinds of related services were more likely to be provided to cohort 2 than cohort 1 students, including mental health, social work, and health services; assistive devices and adaptations; and orientation and mobility training.

- Each of the 11 kinds of related services investigated in both NLTS and NLTS2 was provided significantly more often to cohort 2 students in at least one disability category than to cohort 1 students.
- For the most part, increases in receipt of particular services were largest among students in categories for which they were most directly applicable (e.g., orientation and mobility training increased largely among students with visual impairments), although increases in some kinds of services were more widespread.

Changes in Students' School Participation

Changes in the schools attended by secondary school students with disabilities and in their educational programs raise the question of whether they are accompanied by changes in the successful participation of students with disabilities in these programs. Three dimensions of the school participation of students with disabilities are addressed in both NLTS and NLTS2: school attendance, academic performance (i.e., grades reported by teachers), and school suspensions.

- There was an increase in the average number of days absent for students with disabilities of about 8 days in the school year, which brings the total days absent in a year to an average of more than 4 weeks. Yet cohort 2 students with disabilities were not more likely than students in the general population to be absent, although higher absenteeism was noted for cohort 1 students with disabilities than the general population of students at that time (Wagner, 1991). Nonetheless, missing an average of 23 days of school in a given year may pose a significant obstacle to academic success for students who already experience learning challenges due to disability.
- Regarding academic performance, a shift from students receiving mostly Cs to more students receiving mostly As or Bs resulted in more than half of cohort 2 students with disabilities receiving above-average grades, as reported by teachers. However, the grades earned by 19% of cohort 2 students were mostly Ds or Fs, not a significant improvement over the 24% of cohort 1 students with those low grades.
- Cohort 2 students with disabilities were 8 percentage points more likely than those in cohort 1 to have been suspended during the year. This increase brings the suspension rate

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for cohort 2 students to 20%, a 67% increase over the 12% of cohort 1 students with disabilities who had been suspended during the year.

- Increases in absenteeism and suspensions were particularly large among youth with emotional disturbances; one-fourth of these youth in cohort 2 missed an average of more than 7 weeks of school per year and their suspension rate was twice to four times as high as that of youth in other disability categories.
- Nearly all cohort 2 students with disabilities went to schools that were reported to arrange for alternative placements and continuation of services for students with disabilities who were suspended or expelled from school.

Unequal Benefits

Neither the benefits to students with disabilities nor the potential challenges described above accrued to all groups of youth equally. Students who differed in their primary disability category, grade level, gender, household income, and race/ethnicity showed at least some of these changes to different degrees.

Disability Variations in Changes Over Time

As with so many other aspects of their lives, students with different primary disability classifications experienced some changes in their schools, school programs, and school participation quite differently. Students in most disability categories stand out in some way from their peers, although not in the several ways identified for students with multiple disabilities, mental retardation, or other health impairments, described below.

Students with Multiple Disabilities or Mental Retardation

- Students with multiple disabilities, including deaf-blindness, and to a lesser extent, those with mental retardation experienced wider-ranging changes in their school experiences than most other groups of students. Most of the changes served to align their school experiences more closely with those of their peers, although cohort 2 students with multiple disabilities generally still differed markedly from students in other disability categories in many aspects of their school programs.
- Students with multiple disabilities or mental retardation are two of only three categories of students to have a significant increase in attendance at regular secondary schools and a corresponding decline in attendance at special schools that served only students with disabilities.
- Students with multiple disabilities also are the only group to have significant increases in academic course taking, registering increases in taking every kind of academic course except a foreign language.
- Consistent with these changes, students with multiple disabilities are the only category to demonstrate a significant increase in participation in general education classes overall. However, with the exception of language arts classes, most of their increase in general education course taking involved nonacademic courses.

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- These changes in school programs closed some of the gap between students with multiple disabilities and other students in taking academic and general education classes, but they continued to be less likely to do so than others.
- Students with multiple disabilities or mental retardation are the only two categories to show increases in vocational education course taking, and they account almost entirely for the increase in students with disabilities taking courses in vocational centers. They also are two of only three groups to show increases in life skills instruction, entirely within special education classes.
- Changes in school participation were somewhat more positive for students with multiple disabilities than for those with mental retardation. Students with multiple disabilities showed some improvements in grades over time, but that improvement was not shared by students with mental retardation. In contrast, students with mental retardation showed an increase in their overall absenteeism that did not accrue to students with multiple disabilities.

Students with Other Health Impairments

Students with other health impairments stand out in sharp contrast to the students described above and, indeed, to students in most other categories.

- As noted previously, students with disabilities as a whole showed an increase in the average size of the schools they attended, as well as increases in the percentage of the student body who were students of color and living in poverty. In contrast, cohort 2 students with other health impairments attended smaller schools that had a larger percentage of white students and a smaller percentage of low-income students than did their cohort 1 counterparts in that disability category.
- Students with other health impairments showed the largest suburbanization of their schools, but are the only ones to have that increased suburbanization come from a decline in urban school attendance as well as rural school attendance. However, this group did not show the increases in community resources that were common for students in most other categories.
- Changes in the schools attended by students with other health impairments and in the communities surrounding them are consistent with changes in the characteristics of those students themselves; they were one of only two disability groups to have an increased probability of being white, and they had the largest decrease in the probability that students in that category were living in poverty (Wagner, Cameto et al., 2003).
- Students with other health impairments, along with students with learning disabilities, are the only ones to record no increase in receipt of related services.
- Students with other health impairments showed no improvements in grades over time, and they had the largest increase of any group in school suspensions and the only increase in the average number of days suspended. This may reflect the sizable increase in the prevalence of students with attention deficit/attention deficit-hyperactive disorder (ADHD) in that category. Multivariate analyses of the social adjustment of youth represented in NLTS2 show that having ADHD is associated with a much higher

likelihood of being subject to disciplinary actions at school, independent of other differences between youth in their disabilities, functioning, demographics, and schools programs (Marder et al., 2003).

Grade-Level Variations in Changes Over Time

Comparisons between students with disabilities represented in NLTS and NLTS2 at different grade levels suggest that the transition from middle to high school increasingly has entailed potential challenges.

- The significant increase in the average size of schools attended by students with disabilities occurred entirely among high schools. Cohort 2 students with disabilities transitioned from middle schools with enrollments of about 750 students to high schools that averaged more than 1,300 students. The environments of very large schools can pose impediments to establishing positive relationships and attracting the individual attention of school staff that students with disabilities may need to succeed.
- Among cohort 1 students with disabilities, transitioning to high school was accompanied by a decrease in academic course taking relative to middle school and a growing emphasis on vocational education. Changes over time resulted in academic course taking increasing and vocational education course taking decreasing in the early years of high school for cohort 2 students with disabilities such that no overall decline in academic course taking occurred until students' senior year.
- Ninth grade is the year in which the greatest shift to general education classes for academic courses is noted, increasing the likelihood that students with disabilities would take general education academic classes in their first year in high school. Thus, some 9th graders not only attended larger schools but took primarily general education classes as well.
- High school seniors showed an uneven pattern of school participation. They showed the greatest increase in absenteeism of students at any grade level, yet also showed the largest improvements in grades.

Socioeconomic Variations in Changes Over Time

Students with disabilities who differed in their household incomes and in their racial/ethnic backgrounds also differed in the ways and degrees to which they showed changes in schools, school programs, and school participation. For example:

- Cohort 2 white students and those in the highest income group accrued the greatest changes in factors that may contribute to better odds of participating in postsecondary education. For example, the movement away from special schools and toward regular secondary schools occurred largely among white students and those in the highest income group, as did increases in participation in general education classes and decreases in participation in special education courses.

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- White students with disabilities recorded the most widespread increases in academic course taking, and upper-income students registered the largest increase in taking a foreign language, often a required course for college admission.
- Consistent with an increased academic focus in their course schedules, white and higher-income students were the only groups to show a significant decline in vocational course taking.
- The largest improvement in grades occurred among white students with disabilities and among upper-income students.
- Moreover, increases in community resources were most pronounced among students in these two groups.

Patterns of changes over time were quite different from low-income students and students with disabilities of color, with different groups appearing to benefit:

- Although students with disabilities in all income and racial/ethnic groups experienced the suburbanization of their schools, the increases were largest for the lowest and middle income groups and for African-American and Hispanic students.
- Despite having much greater suburbanization of the communities in which they attended school, African-American and Hispanic students with disabilities, as well as those from the lowest-income households, had very few increases in resources in their communities.
- Students with disabilities from low-income households were the only income group with a significant increase in enrollment in general education academic classes overall and in general education mathematics, science, and social studies classes in particular.
- However, low-income students recorded the smallest improvements in grades and the largest increase in the likelihood of being suspended from school.
- Although African-American students with disabilities registered increases in their rates of taking some kinds of academic courses, none of the increases in taking academic courses in general education classes that are noted among students with disabilities as a whole were shared by African-American students. African-American students with disabilities who were taking life skills courses also had the largest decline in the likelihood that they would be in general education classes and the largest increase in the likelihood that they would be in special education classes.
- Hispanic students with disabilities had the largest gain in enrollment in general education academic courses of any racial/ethnic group.
- Hispanic students with disabilities were the only group not to experience an improvement in their grades. However, neither did they show the increase in absenteeism or suspensions that occurred among white and African-American students with disabilities.

Summing Up: Clear, but Uneven Progress for Students with Disabilities

Youth with Disabilities: A Changing Population, an earlier comparison of information reported by parents of NLTS and NLTS2 students (Wagner et al., 2003), documented many

changes over a period of about a decade and a half in the characteristics of youth with disabilities, their households, and some aspects of their experiences. Summarizing those changes, that report raised the question, "have they been for the better?", and concluded that "in many respects, the answer to that question is 'yes,' but that answer applies to some youth more than to others. Findings also point to several challenges remaining for youth with disabilities, their families, and the schools that serve them" (Wagner et al., 2003, p. 6-1). The same question can be raised in response to the changes in the schools, school programs, and school participation of secondary school students with disabilities that have been reported by school staff and described in this document. And in many respects, the answer to the question is the same. Many of the changes identified are good news indeed for students with disabilities, their families, and their schools. However, not all students with disabilities shared equally in those positive changes, and that is cause for concern.

The differences over time between groups of students with disabilities in their school experiences raise the question of whether there may be related differences in postschool outcomes. Comparisons of findings from the second wave of data collection of NLTS and NLTS2 will examine the course-taking pattern of students with disabilities over their full high school careers and their achievements in the early years after high school.

This is an executive summary of Wagner, M., Newman, L., & Cameto, R. (2004). *Changes over time in the secondary school programs of students with disabilities. A report of findings from the National Longitudinal Transition Study and the National Longitudinal Transition Study-2 (NLTS2*). Menlo Park, CA: SRI International.

1. INTRODUCTION

The No Child Left Behind Act of 2001 (NCLB) and scores of state and local initiatives culminate nearly two decades of increasing emphasis on the improvement of American education. Those efforts have had significant impacts on the school experiences of America's high school students. For example, since the mid-1980s, many states have increased the course requirements for students to earn a high school diploma, and the proportion of the high school student population that earned at least four credits in language arts, three in social studies, and two each in math and science has more than doubled in response (National Center for Education Statistics, 2001).

In addition to efforts to improve the education system and academic performance of students as a whole, changes in policies and practices related to special education are intended to benefit students who receive special education services as well. The Individuals with Disabilities Education Act Amendments of 1997 (IDEA '97) embody many of those changes. For example, the act requires that a statement of a student's transition service needs be included in his or her individualized education program (IEP) each year and that the IEP include the course of study the student should pursue to achieve his or her postschool goals.

How have the school experiences of students who receive special education services in middle and high school evolved in response to these changes in policy and practice?

Two research projects sponsored by the Office of Special Education Programs (OSEP) of the U.S. Department of Education help address that question by documenting changes in several important aspects of the secondary school experiences of students with disabilities over the period of about a decade and a half since the mid-1980s. The National Longitudinal Transition Study (NLTS) generated nationally representative information about secondary-school-age youth who were receiving special education services in 1985.[1] To assess the status of youth with disabilities[2] in the early 21st century, OSEP commissioned the National Longitudinal Transition Study-2 (NLTS2).[3] It addresses many of the same issues as NLTS but extends its scope in important ways. Key features of the two studies are summarized in Exhibit 1-1.

Comparisons of findings for youth who were represented in NLTS with those for youth represented in NLTS2 illuminate the extent to which and ways in which special education and the youth it serves have changed in the years between the studies. Those comparisons are the focus of this report, whose purpose is descriptive.

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[1] NLTS methods and postschool findings are summarized in Blackorby and Wagner (1996). A more complete summary and a list of reports available from NLTS are available at http://www.sri.com/policy/cehs/dispolicy/nlts.html.

[2] Although the populations represented in NLTS and NLTS2 are youth who were receiving special education services, for convenience, the broader phrases "students with disabilities" and "youth with disabilities" are used to describe them in this report.

[3] Additional information on the NLTS2 design and on reports available from the study can be found at http://www.nlts2.org.

Exhibit 1-1
KEY FEATURES OF NLTS AND NLTS2

NLTS	NLTS2
Study Duration	
• 1984 through 1993	• 2001 through 2010
Sample Members	
• Youth receiving special education, ages 15 through 23 in the 1985-86 school year. The oldest youth for whom data were collected were age 27 in Wave 2 (1990) and had been out of secondary school up to 5 years.	• Youth ages 13 through 16 and receiving special education in grade 7 or above in December 2000. The oldest youth will be 26 when the last data are collected.
Population to Which Findings Generalize	
• Youth with disabilities as a whole nationally and youth in each federal special education disability category individually.	• Youth with disabilities as a whole nationally and youth in each federal special education disability category individually.
Data Sources	
• Wave 1: Parents (telephone interviews); school record abstracts (information abstracted by school personnel from students' high school records); principals (school background survey). • Wave 2: Parents (telephone interviews); youth (telephone interviews); school staff best able to describe students' overall school program (school program survey); principals (school background survey); students' high school transcripts.	• Wave 1: Parents (telephone interviews); youth (direct assessment of academic abilities, youth in-person interview on attitudes toward school); teachers (general education teacher survey); school staff best able to describe students' overall school program (student's school program survey); principals (school characteristics survey); students' high school transcripts. • Wave 2: Parents (telephone interviews); youth (telephone interviews, direct assessment of academic abilities, youth in-person interview on attitudes toward school); teachers (general education teacher survey); school staff best able to describe students' overall school program (student's school program survey); students' high school transcripts. • Waves 3 and 4: Parents (telephone interviews); youth (telephone interviews); students' high school transcripts. • Wave 5: Parents (telephone interviews); youth (telephone interviews).
Years of Data Collection	
• Wave 1 parent interviews, 1987 • Wave 1 school data collection, 1985-86 or 1986-87 school year • Wave 2, all data, 1990	• Wave 1 parent interviews, 2001 • Wave 1 school data collection and direct assessments of youth, 2001-02 school year • Wave 2 parent/youth interviews, 2003 • Wave 2 school data collection and direct assessments of youth, 2003-04 school year • Wave 3, 2005 • Wave 4, 2007 • Wave 5, 2009

Findings presented here were generated by comparing information from the first wave of school surveys and school record abstracts conducted for NLTS students (cohort 1) for the 1985-86 or 1986-87 school year,[4] with data from school surveys conducted for NLTS2 students (cohort 2) in the 2001-02 school year. Analyses include the age group of students for which school data were collected in Wave 1 of both studies: 14- through 18-year-olds.[5]

Comparisons of school data from NLTS and NLTS2 document changes in the following aspects of the school experiences of secondary school students with disabilities:

- Characteristics of their schools, including the types of schools attended, characteristics of their student bodies, selected school programs, the kinds of communities in which the schools were located, and the resources in them (Chapter 2).
- Characteristics of their school programs, including courses taken, instructional settings, and related services provided to students with disabilities (Chapter 3).
- School participation, including school attendance, academic performance (grades), and suspensions from school (Chapter 4).

Data on these aspects of students' secondary school experiences were collected for cohort 1 students through a mail survey of principals of the schools they attended most recently (i.e., the school background survey). This survey asked principals to report on the characteristics of their school (e.g., the type of school, enrollment), their student bodies (e.g., racial/ethnic distribution), aggregate statistics of several kinds (e.g., average absenteeism, the percentage of students who graduated), policies relevant to students with disabilities, staff and programmatic resources available in the school, and other resources available in the community surrounding the school. In addition, a school staff member was recruited to abstract information from students' school records (i.e., the school record abstract form) on courses taken in the school year and, for each course, the setting (general or special education) and the grade received. Data on related services provided and the student's absenteeism, suspensions, and school-leaving status (for those no longer in school) also were collected from students' school records.

For NLTS2 students, data for this report are drawn from two mail surveys, conducted with school staff in the spring of the 2001-02 school year. First, a school staff person who could report on the characteristics and policies of each school attended by an NLTS2 study member (often the principal) was asked to complete the school characteristics survey to provide information similar to that collected for NLTS. School-level information for each cohort was linked to each study member enrolled at a given school. In addition, school staff were asked to identify the staff person most knowledgeable about the overall school programs of specific individual students; these persons often were special educators. A multipurpose survey then was conducted with those school staff (i.e., the student's school program survey), which identified the courses taken at the time and the setting for each of those courses. Information also was obtained on related and support services and programs provided to students, their transition

[4] Data were collected in 1987 for each student's most recent school year—either the 1985-86 or 1986-87 school year.

[5] The samples are weighted to have the same distribution of these age groups: 21% are 14, 22% are 15, 23% are 16, 32% are 17, and 2% are 18.

planning experiences, and some aspects of their school performance (e.g., absenteeism, disciplinary actions, overall grades).

This report highlights the extent and direction of change for the population of 14- through 18-year-old youth with disabilities as a whole and for key subgroups. Perhaps the most important subgroups are youth who differed with regard to the primary disability that made them eligible for special education services. To document the ways in which the populations of youth with different disabilities experienced change over time, findings are presented for youth in the nine disability categories that were in use in both 1987 and 2001. Readers should note that youth are included in the disability categories assigned to them by the schools or school districts from which they were selected for the studies. Variations in eligibility determination processes among school districts and over time underscore the importance of interpreting findings as describing youth who were categorized as having a particular primary disability by their school or district; what students' actual disability diagnoses would be if they were subjected to uniform diagnostic processes are unknown. In addition to disability category differences, changes also are described for youth with disabilities who differ in their gender, the income of their households, and their racial/ethnic background, where significant.[6]

NLTS and NLTS2 have many design features that facilitate valid comparisons between them, and detailed studies of both school district and student nonresponse indicate that NLTS and NLTS2 accurately represent the populations of youth with disabilities at their respective points in time. However, important differences exist between them that have required analytic adjustments for comparisons to be valid. One important difference is the age ranges for youth included in the two studies. In Wave 1 of NLTS, youth were 14 through 22 years old in their most recent school year, whereas the first wave of NLTS2 school surveys were about youth who were 14 through 18. Because age is a powerful determinant of experience, straightforward comparisons between the full sample of youth in NLTS and NLTS2 are not valid. To improve the comparability of the studies, youth of similar ages, 14 through 18, were selected from each sample. Differences in the membership of particular disability categories in use at the two points in time also have required analytic adjustments to improve comparability. For example, although youth with autism as their primary disability now are counted in a separate category, in 1987 they generally were included in the category of other health impairment; thus, for comparability, NLTS2 youth with autism also must be analyzed as part of the other health impairment category.

In addition, readers should remember the following issues when interpreting the findings in this report:

- **Findings are weighted.** NLTS and NLTS2 were designed to provide a national picture of the characteristics, experiences, and achievements of youth with disabilities in their respective age ranges. Therefore, all the statistics from the studies are weighted estimates of the national population of students receiving special education in the studies' age ranges at the time of the studies, as well as of each disability category individually. Each response for each sample member is weighted to represent the number of youth nationally that are in his or her disability category in the kind of school district (defined

[6] The intercorrelation between income and racial/ethnic background is acknowledged. This initial comparison of the NLTS/NLTS2 cohorts does not attempt the multivariate analyses needed to disentangle that interrelationship.

by region, student enrollment, and proportion of students in poverty) or special school from which he or she was selected.

- **Standard errors.** For each mean and percentage in this report, a standard error is presented that indicates the precision of the estimate. For example, a variable with a weighted estimated value of 50% and a standard error of 2 means that the value for the total population, if it had been measured, would, with 95% confidence, lie between 48% and 52% (i.e., within plus or minus 2 percentage points of 50%). Thus, smaller standard errors allow for greater confidence to be placed in the estimate, whereas larger ones require caution.
- **Small samples.** Although NLTS and NLTS2 data are weighted to represent the population, the size of standard errors is influenced heavily by the actual number of youth in a given group (e.g., a disability category). Groups with very small samples have comparatively large standard errors (in fact, findings are not reported separately for groups that do not include at least 35 sample members); readers should be cautious in interpreting results for groups with small sample sizes and large standard errors.
- **Significant differences.** In discussions of the descriptive statistics, only differences among groups that reach a level of statistical significance of at least .05 are mentioned in the text; significance levels generally are noted in the text.

Appendix A provides further information on specific methods used in the two studies, adjustments made to enhance their comparability, weighting of the samples, and interpretation of the population estimates that result. Appendix B contains the unweighted sample sizes from which weighted means and percentages were calculated.

2. THE CHANGING SCHOOL ENVIRONMENTS OF STUDENTS WITH DISABILITIES

Students' experiences at school are shaped in important ways by their own instructional programs and extracurricular involvement and by what students bring to them. However, the schools in which those experiences occur also can influence students' learning, engagement, performance, and satisfaction. For example, there is a growing movement in support of smaller high schools (e.g., Coalition of Essential Schools, 2003) because they are believed to provide a context that is more conducive to authentic instruction, positive student-adult and student-student relationships, and effective preparation for postschool success than is possible in much larger schools. Similarly, increases in standards for teacher quality embedded in the No Child Left Behind Act of 2001 (NCLB) recognize that adequate staff resources in schools are a key ingredient in improving student achievement.

Aspects of the school context can be important for all students, but perhaps particularly so for students with disabilities, who may be challenged in their ability to succeed in their instructional programs or to engage in positive relationships at school. Thus, knowledge of the characteristics of schools attended by students with disabilities is important to an understanding of the relationships between school programs and services and student outcomes.

This chapter provides a backdrop for subsequent analyses of changes in students' school programs and performance by describing changes between the time periods of NLTS and NLTS2 in the following features of the school contexts of secondary school students with disabilities:[1]

- The types and locations of their schools
- Enrollment
- Characteristics of the student bodies
- Selected federal programs and special education placement options available in schools
- Community resources.

These aspects of schools attended by students with disabilities are described by using data drawn from the NLTS school background survey, completed by principals in the 1986-87 school year, and data from the NLTS2 school characteristics survey, completed in the 2001-02 school year by school staff able to describe the schools attended by NLTS2 students and the programs, policies, and resources in them.

Changes in characteristics of schools are described for secondary school students with disabilities as a group and for middle and high school students when they differ.[2] They also are

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[1] This chapter reports the characteristics of schools attended by a nationally representative sample of students with disabilities; those schools do not constitute a nationally representative sample of schools. Percentages reported are percentages of students who attend schools with particular characteristics, not percentages of schools with those characteristics.

[2] For convenience, 7th and 8th graders are referred to as middle school students and those in 9th through 12th grades are referred to as high school students. Students with disabilities who are not assigned to a grade level are not included in analyses of changes that differ across grade levels.

described for students who differ in their primary disability category, household income, and racial/ethnic background, where significant.

Changes in the Types and Locations of Schools Attended

NLTS took the first national look at the school programs of secondary school students with disabilities at the beginning of the Regular Education Initiative (Will, 1986). Since that time, the movement to include students with disabilities in regular schools, where they may have a greater opportunity for access to the general education curriculum, has resulted in schooling for more students with disabilities resembling the schooling of their nondisabled peers. A comparison of NLTS and NLTS2 confirms a "trend toward inclusive environments" (U.S. Department of Education, 2002, p. III-44). The proportion of students with disabilities attending regular schools that serve the general population of students increased by 3 percentage points ($p<.05$; Exhibit 2-1), so that by 2001, 94% of secondary school students with disabilities were attending such schools.

Exhibit 2-1
CHANGES IN TYPES OF SCHOOLS ATTENDED BY STUDENTS WITH DISABILITIES

	Cohort 1 (1985-86/ 1986-87)	Cohort 2 (2000-01)	Percentage-Point Change
Percentage attending:			
A regular secondary school	90.5 (1.0)	93.9 (1.0)	**+3.4***
A school serving only students with disabilities	6.3 (.8)	2.6 (.7)	**-3.7*****
A vocational-technical school	1.6 (.4)	.8 (.4)	-.8
An alternative/continuation school	1.3 (.4)	.1 (.1)	**-1.2****
A magnet school	.2 (.1)	1.1 (.4)	**+.9***
Another kind of school	.0	1.5 (.5)	**+1.5****
Percentage attending school in a community that was:			
Urban	28.1 (1.5)	29.2 (1.9)	+1.1
Suburban	35.4 (1.6)	56.8 (2.0)	**+21.4*****
Rural	36.5 (1.6)	14.0 (1.4)	**-22.5*****

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

There was a corresponding 4-percentage-point reduction in enrollment in special schools that serve only students with disabilities ($p<.001$). This decline in special school attendance by secondary school students with disabilities mirrors that for the population of students with disabilities ages 3 through 21, as reported to the U.S. Department of Education in the federal child count. Attendance at special schools and facilities declined for students with disabilities overall, from 7% in the 1986-87 school year (U.S. Department of Education, 1989) to 4% in the 1999-2000 school year (U.S. Department of Education, 2002). A decline in enrollment in alternative or continuation schools and an increase in attendance at magnet and "other" schools (e.g., charter schools, schools in juvenile justice facilities) were quite small, although the differences are statistically significant.

A geographic shift also occurred in the student populations represented in NLTS and NLTS2. Students in cohort 2 were substantially less likely to attend schools in rural areas and much more likely to do so in suburban communities than peers in the 1980s. This shift toward attending schools in suburban communities reflects in part the "oncoming incipient

suburbanization" of the population as a whole (Economic Research Service, 2000, p. 1)—the sprawl of population out of metro areas to adjacent nonmetro counties, which converts rural to suburban areas. In fact, "the 2000 Census confirms that the decentralization of economic and residential life remains the prevailing trend in metropolitan America today" (Lucy & Phillips, 2001, p. 2). However, another contributor to the large increase in the number of students living in suburban areas is the fact that the NLTS sample was much less likely to be living in suburban areas in 1987 than were students in the general population (35% vs. 48%, $p<.001$; Marder & Cox, 1991). Thus, cohort 2 students with disabilities more closely resemble the general population in metropolitan status than did cohort 1 students.

The shift toward suburban communities is likely to help explain a variety of other changes in the characteristics of schools attended by students with disabilities, as reported in the remainder of this chapter.

Changes in Student Body Characteristics

Our schools reflect our nation, and as America's population has grown and become more diverse, so has the student population, with important implications. The characteristics of a school's inhabitants are often critical but overlooked factors in understanding the dynamics of schools and the experiences of students in them. This section examines several characteristics of the student bodies of schools attended by students with disabilities, including their size and racial/ethnic distribution, the prevalence of English language learners (ELL), and students' household economic status. The prevalence of students with disabilities being served in schools also is reported.

Enrollment

Cohort 2 secondary school students with disabilities attended larger schools, on average, than did their peers in cohort 1 (Exhibit 2-2). Average enrollment increased over time by more than 25%, from 951 to 1,205 ($p<.001$). This sizable increase is consistent with the shift away from attending schools that serve only students with disabilities, which tend to be small, and away from rural communities, which also tend to have smaller schools than the suburban areas toward which the population shifted.

Although the number of students enrolled in secondary schools nationally also has increased, that increase has been only about half as large (12%); average school enrollment nationally grew from 711 students in the 1987-88 school year to 795 in 2000-01 (National Center for Education Statistics, 2002a). However, at both times, students with disabilities tended to go to larger schools than their peers in the general population did ($p<.001$). Further, there is a clear pattern of lower student enrollments in middle schools than in high schools, with no increase over time in the size of middle schools. The average enrollment in schools attended by seventh- and eighth-grade students with disabilities in cohort 1 was 819, compared with 759 for cohort 2. In comparison, cohort 1 high school seniors with disabilities attended schools with an average enrollment of 992, which increased by almost one-third for cohort 2 (1,311; $p<.01$).

Exhibit 2-2
CHANGES IN ENROLLMENT IN SCHOOLS ATTENDED BY STUDENTS WITH DISABILITIES

	Cohort 1 (1985-86/ 1986-87)	Cohort 2 (2000-01)	Change in School Enrollment
Average enrollment in schools attended by:			
All secondary school students with disabilities	951 (22)	1,205 (31)	**+254*** **
7th and 8th graders	819 (57)	759 (49)	-60
9th graders	1,030 (54)	1,170 (64)	+140
10th graders	962 (47)	1,357 (66)	**+395*** **
11th graders	994 (52)	1,228 (61)	**+190** **
12th graders	992 (70)	1,311 (94)	**+319** **

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: **=p<.01, ***=p<.001.

Research suggests that the larger size of schools attended by students with disabilities could be cause for concern. Attending large schools can have adverse effects for racial and ethnic minorities and for students living in low-income households (Haller et al., 1993; Howley & Bickel, 2000; Roza, 2001; Wasley, 2002)—groups that are disproportionately represented among students with disabilities (Marder, Levine, & Wagner, 2003; Marder, Levine, Wagner, & Cardoso, 2003). In contrast, lower student enrollments have been linked to improvements in student and staff attitudes, social behavior, extracurricular participation, attendance, graduation rates, parent involvement, and student attributes, such as feelings of belonging, self-concept, interpersonal relations, and a sense of personal responsibility (Cotton, 2001; Haller et al., 1993).

Racial/Ethnic Background

The increase in America's racial/ethnic diversity is mirrored in the schools attended by students with disabilities (Exhibit 2-3). Although small decreases in the average percentage of white and African-American students in schools attended by students with disabilities as a whole do not attain statistical significance, a 3-percentage-point growth in the Hispanic student population ($p<.01$) and a 1-percentage-point increase in the average proportion of the student body who are Asian or Pacific Islander ($p<.01$) are statistically significant. These changes in the racial/ethic backgrounds of the student bodies in schools attended by students with disabilities for the most part mirror changes in the general student population (Child Trends, 2003) and make their schools very similar. In the 2000-01 school year, students nationally went to schools where 64% of students were white, 15% were African American, 16% were Hispanic, 4% were Asian or Pacific Islander, and 1% were American Indian or Alaska Native (Federal Interagency Forum on Child and Family Statistics, 2001).

Exhibit 2-3
CHANGES IN STUDENT BODY CHARACTERISTICS OF SCHOOLS ATTENDED BY STUDENTS WITH DISABILITIES

	Cohort 1 (1985-86/ 1986-87)	Cohort 2 (2000-01)	Percentage-Point Change
Average percentage of the student body who were:			
White	70.3 (1.1)	67.2 (1.3)	-3.1
African American	17.9 (.9)	15.9 (1.0)	-2.0
Hispanic	8.7 (.7)	12.0 (.9)	**+3.3****
Asian/Pacific Islander	2.3 (.2)	3.3 (.3)	**+1.0****
American Indian/Alaska Native	.9 (.2)	1.2 (.2)	+.3
Percentage attending schools where students eligible for free or reduced-price lunches were:			
Fewer than 25% of the student body	51.4 (1.7)	45.4 (2.1)	**-6.0***
25% to 50% of the student body	28.2 (1.5)	34.0 (2.0)	**+5.8***
More than 50% of the student body	20.4 (1.4)	20.6 (1.7)	+.2

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01.

Poverty Status

Participation in the National School Lunch Program (NSLP) is common in schools attended by students with disabilities. Through it, students from households with incomes below 185% of the federal poverty level are eligible for reduced-price lunches, and those from households with incomes below 130% of poverty level are eligible for free lunches. Cohort 2 students with disabilities were more likely to attend schools with higher concentrations of students who were eligible for the NSLP than were cohort 1 students (Exhibit 2-3).

More than half (51%) of cohort 1 students with disabilities went to schools where fewer than one-fourth of the students were eligible for the NSLP, compared with 45% of cohort 2 students ($p<.05$). Instead, cohort 2 students were more likely than their peers in cohort 1 to attend schools where one-fourth to one-half of students were eligible for free or reduced-price lunches ($p<.05$). This greater concentration of low-income students in the schools attended by cohort 2 students with disabilities is somewhat inconsistent with the fact that cohort 2 students themselves were much less likely to be living in poverty than their cohort 1 peers (29% vs. 38%, $p<.01$; Wagner, Cameto, & Newman, 2003) and more likely to be living in suburban, presumably wealthier communities, as shown in Exhibit 2-1.

Students with Disabilities in the Schools

Data reported to the federal government have shown a steady increase over the last 25 years in the number of students receiving special education services (U.S. Department of Education, 2003). However, this increase in the special education student population has not translated into an increase in their proportion of the student bodies in their schools (Exhibit 2-4). Cohort 1 students went to schools where principals reported that students who received special education services were 17% of the student body, on average, a percentage that was virtually unchanged for cohort 2. However, those similar averages mask some changes in the actual concentrations of students with disabilities in schools. Cohort 2 students were much more likely than their

Exhibit 2-4
CHANGES IN THE PERCENTAGE OF STUDENTS RECEIVING SPECIAL EDUCATION IN THE SCHOOLS THEY ATTENDED

	Cohort 1 (1985-86/ 1986-87)	Cohort 2 (2000-01)	Percentage-Point Change
Average percentage of the student body receiving special education services	17.4 (.9)	16.5 (.7)	-.9
Percentage in schools where students receiving special education were:			
5% or fewer of the student body	14.8 (1.3)	4.0 (.8)	**-10.8*****
5.1% to 10% of the student body	40.1 (1.7)	22.8 (1.8)	**-17.3*****
10.1% to 15% of the student body	21.8 (1.5)	40.6 (2.1)	**+18.8*****
15.1% to 75% of the student body	15.4 (1.3)	29.8 (1.9)	**+14.4*****
More than 75% of the student body	7.8 (.9)	2.8 (.7)	**-5.0*****

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following level: ***=p<.001.

peers in cohort 1 to go to schools where students who received special education services were between 10% and 75% of the student body (p<.001) and much less likely to go to schools where they were a smaller or larger percentage than that. The reduction in students going to schools where more than three-fourths of students received special education services is consistent with the move away from special schools that serve only students with disabilities.

Changes in School Programs and Placement Options

NLTS and NLTS2 collected information on the availability of two federal programs: Title I, the federal compensatory education program, and English as a second language (ESL) programs. Information also was obtained on various placement options available for students with disabilities.[3]

Since 1965, Title I of what was then the Elementary and Secondary Education Act has authorized supplemental federal aid to schools who serve a large proportion of low-income students to help improve their academic performance. Cohort 2 students with disabilities were much less likely to have the federal Title I compensatory education program available in their schools than was true of cohort 1 students (Exhibit 2-5); one-half of cohort 1 students went to schools with a Title I program, compared with fewer than one-third of students in cohort 2 (p<.001). This change is somewhat surprising in light of the fact that schools attended by cohort 2 students tended to have a larger concentration of low-income students who were eligible for free or reduced-priced lunches than cohort 1 schools (as shown in Exhibit 2-3). However, the noted decrease in Title I availability is consistent with a decrease of 11 percentage points in schools participating in the program nationally (Sinclair, 2002). The decreases in Title I availability in schools attended by students with disabilities occurred at high school grade

[3] Respondents to the NLTS school background survey responded to the following item: "Please indicate which of the following compensatory education programs are available to secondary students at your school." Four response categories were provided. Respondents to the NLTS2 school characteristics survey were asked, "Which of the following services, resources, or programs does this school have available to students, either as part of a curriculum or before or after school hours?" Twenty-eight response categories were provided. Title I and ESL programs are the two response categories included in both surveys.

Exhibit 2-5
CHANGES IN SELECTED PROGRAMS AND PLACEMENT OPTIONS AVAILABLE IN SCHOOLS ATTENDED BY STUDENTS WITH DISABILITIES

	Cohort 1 (1985-86/ 1986-87)	Cohort 2 (2000-01)	Percentage-Point Change
Percentage in schools with:			
A Title I program	50.1 (1.7)	30.4 (1.9)	**-19.7*** **
An English as a second language program	39.8 (1.6)	55.7 (2.1)	**+15.9*** **
Percentage in schools with the following placement options available for students with disabilities:			
General education class	93.8 (.9)	95.8 (.8)	+2.0
Special education resource room	91.5 (1.1)	93.2 (1.1)	+1.3
Self-contained special education class	69.5 (1.8)	86.7 (1.4)	**+17.2*** **

Source: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following level: ***=p<.001.

levels (17 to 24 percentage points, p<.01 and p<.001); there was no significant change in programs available in schools attended by seventh and eighth graders.

Programs for students who speak English as a second language (ESL) have become much more common in schools attended by students with disabilities; more than half of cohort 2 students (56%) were going to schools with such programs, a 16-percentage-point increase over cohort 1 (p<.001). This finding is consistent with the increase in Hispanic and Asian/Pacific Islander students in the schools (shown in Exhibit 2-3) and with the fact that cohort 2 students themselves were much more likely than cohort 1 peers to use primarily a language other than English at home (Wagner, Cameto, et al., 2003).

In addition to these changes in the prevalence of Title I and ESL programs, placement options available for serving students with disabilities also have changed.[4] General education inclusion programs and special education resource rooms were available in the vast majority of schools attended by students with disabilities in both cohorts, and their availability did not change over time. However, self-contained special education classes, which were available in schools attended by only about two-thirds of cohort 1 students, became substantially more common, so that 87% of cohort 2 students with disabilities went to schools with such programs (p<.001). Self-contained classrooms may have been established in some schools to serve the influx of students who previously would have attended special schools only for students with disabilities. However, the increase in the availability of self-contained placements should not be construed as implying there has been an increase in the prevalence of students with disabilities being instructed in them. The U.S. Department of Education has documented a decline from 25% to 23% between the 1986-87 and 1995-96 school years[5] in the percentage of students ages 3 through 21 who received instruction in a separate special education class (U.S. Department of Education, 1989; U.S. Department of Education, 1998).

[4] NLTS respondents were asked, "Which of the following placement options did your school have for secondary special education students in the 1986-87 school year?" NLTS2 respondents were asked, "Which of the following placement options are available to students with disabilities at this school?"

[5] After the 1995-96 school year, placement data were reported in different categories, so participation in separate special education classes can no longer be identified.

Changes in Community Resources

The likelihood that students with disabilities will achieve positive outcomes both during secondary school and in their postschool years can be affected by the kinds of resources available in their communities. For example, having alternatives to regular high schools (such as an alternative or continuation school or a vocational-technical school) can give students access to instructional programs or learning environments that may be more appropriate to their needs and interests than those of regular secondary schools. Similarly, having postsecondary education and training institutions in their community can facilitate the continuation of education after high school for youth with disabilities. And some youth with disabilities will be able to enter the workforce if supported employment programs or transportation accommodations are available.

Exhibit 2-6
CHANGES IN COMMUNITY RESOURCES AVAILABLE TO STUDENTS WITH DISABILITIES

	Cohort 1 (1985-86/ 1986-87)	Cohort 2 (2000-01)	Percentage-Point Change
Percentage attending schools in communities with:			
A special school for students with disabilities	65.3 (1.8)	59.1 (2.5)	**-6.2***
An alternative/continuation school	61.8 (1.8)	94.9 (1.0)	**+33.1*****
A secondary vocational-technical school	71.8 (1.7)	80.9 (1.8)	**+9.1*****
A magnet school	27.2 (1.7)	38.8 (2.5)	**+11.6*****
A work facility for adults with disabilities	82.7 (1.4)	92.4 (1.3)	**+9.4*****
A group home	77.8 (1.6)	91.6 (1.4)	**+13.8*****
A center for independent living	61.5 (2.0)	80.2 (2.1)	**+18.7*****
Advocacy groups for persons with disabilities	86.1 (1.3)	95.5 (1.0)	**+9.4*****
Support groups for persons with disabilities	81.3 (1.5)	92.8 (1.3)	**+11.5*****
Transportation accommodations	77.3 (1.6)	81.5 (1.9)	+4.2
A publicly supported job training program	88.0 (1.2)	89.7 (1.5)	+.7

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, ***=p<.001.

NLTS and NLTS2 investigated the prevalence of these forms of support in the communities in which youth with disabilities attended schools by asking respondents to indicate which of several forms of resources existed in their communities. In general, youth with disabilities were reported to live in more resource-rich communities in 2001 than in the mid 1980s (Exhibit 2-6). The data show significant increases in students' access to 8 of the 11 community resources investigated in the two studies.[6]

Increases in secondary education options may reflect the growing interest in providing families and students with choices regarding school settings. The largest increase noted is in the

[6] Some of the increases in resources shown in Exhibit 2-6 may result from a difference between the two studies in the wording of the questionnaire items from which this information is taken. NLTS asked principals about the presence of different kinds of educational institutions and other kinds of programs, using the following two questions: "Are the following types of schools available in your community?" and "Does your community have the following resources?" NLTS2 asked a single question, with response categories similar to NLTS, but used a different geographic reference: "Which of the following are available in this community or nearby (e.g., within 20 miles)?" If the geographic area considered by respondents to NLTS2 was larger than what respondents in NLTS considered their "community," a higher prevalence of some programs could result.

prevalence of alternative or continuation schools. In cohort 1, 62% of students with disabilities had access to an alternative or continuation high school, whereas almost all cohort 2 youth (95%) had access to such schools ($p<.001$). However, this increase in access is not reflected in actual attendance by students with disabilities; Exhibit 2-1 depicts a small but significant decline in attendance at alternative or continuation schools.

Secondary vocational-technical schools and magnet schools also were significantly more prevalent in cohort 2 than earlier, with 9- and 12-percentage-point increases, respectively, in their availability ($p<.01$). Programs that support the employment and independence of adults with disabilities also were more accessible to cohort 2 than cohort 1 youth, particularly centers for independent living and group homes (19- and 14-percentage-point increases, respectively; $p<.001$). It is unknown how much of these increases in access to resources resulted from the significant shift in the population of students with disabilities from rural to suburban communities.

Only access to special schools for students with disabilities declined over time (6 percentage points, $p<.05$); access to transportation accommodations and access to publicly supported job training programs did not change.

Differential Changes in School Characteristics across Disability Categories

There are notable differences in the extent to which the changes in school characteristics that have been discussed thus far are associated with individual disability categories. The following sections describe the changes in schools that have occurred differentially across disability categories.

Changes in the Types and Locations of Schools Attended

The significant increase in students with disabilities attending regular schools and the corresponding decline in attendance at special schools serving only students with disabilities (presented in Exhibit 2-1) occurred only for students with mental retardation, orthopedic impairments, or multiple disabilities[7] (Exhibit 2-7). They show significant increases in regular school attendance ranging from 8 to 29 percentage points ($p<.01$ to $p<.001$). Their declines in special school attendance range from 8 to 26 percentage points ($p<.01$ to $p<.001$). Students with hearing impairments show a decline in attendance at special schools (9 percentage points, $p<.05$) but no corresponding significant increase in regular school attendance. The changes are largest for students with multiple disabilities. More than 8 in 10 cohort 2 students in that category attended regular schools, compared with about half of students in cohort 1 ($p<.001$). About 15% of cohort 2 students with multiple disabilities attended special schools serving only students with disabilities, a 26-percentage-point decline.

[7] Because there are too few students with deaf-blindness to report separately, they are combined with students with multiple disabilities for analyses reported in this section.

Exhibit 2-7
CHANGES IN TYPES AND LOCATIONS OF SCHOOLS ATTENDED, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage attending:									
A regular secondary school									
Cohort 1 (1985-86/1986-87)	94.9	93.9	84.1	84.4	68.1	67.9	85.9	92.9	52.8
	(1.1)	(1.7)	(2.0)	(2.4)	(2.8)	(3.9)	(2.8)	(2.3)	(5.3)
Cohort 2 (2000-01)	96.2	95.0	92.5	85.9	76.1	72.7	95.4	93.7	81.8
	(1.2)	(1.3)	(1.7)	(2.7)	(3.1)	(4.2)	(1.5)	(1.3)	(2.6)
Percentage-point change	+1.3	+1.1	**+8.4****	+1.5	+8.0	+4.8	**+9.5****	+.8	**+29.0*****
A school serving only students with disabilities									
Cohort 1 (1985-86/1986-87)	1.6	3.6	13.6	11.7	29.6	27.8	11.0	5.6	41.0
	(.6)	(1.3)	(1.9)	(2.1)	(2.7)	(3.7)	(2.5)	(2.0)	(5.3)
Cohort 2 (2000-01)	.2	.6	5.2	9.9	20.9	23.4	2.9	2.7	15.2
	(.3)	(.5)	(1.4)	(2.3)	(2.9)	(4.0)	(1.2)	(.9)	(2.4)
Percentage-point change	-1.4	-3.0	**-8.4*****	-1.8	**-8.7***	-4.4	**-8.1****	-2.9	**-25.8*****
An alternative/continuation school									
Cohort 1 (1985-86/1986-87)	1.1	.9	1.3	2.5	.3	3.0	1.4	1.2	4.4
	(.5)	(.7)	(.6)	(1.0)	(.3)	(1.4)	(1.0)	(1.0)	(2.2)
Cohort 2 (2000-01)	.0	1.2	.0	.0	.0	.0	.2	1.1	.1
		(.7)					(.3)	(.6)	(.2)
Percentage-point change	**-1.1***	+.3	**-1.3***	**-2.5***	-.3	**-3.0***	-1.2	0.1	4.3
Percentage attending school in a community that was:									
Urban									
Cohort 1 (1985-86/1986-87)	27.0	27.9	22.1	39.7	42.6	37.8	40.5	55.8	29.6
	(2.3)	(3.2)	(2.3)	(3.3)	(3.6)	(4.9)	(4.0)	(4.4)	(5.4)
Cohort 2 (2000-01)	29.8	26.2	26.8	30.7	39.9	45.3	38.4	22.6	25.2
	(2.9)	(2.7)	(2.8)	(3.6)	(3.6)	(4.7)	(3.4)	(2.2)	(3.0)
Percentage-point change	+2.8	-1.7	+4.7	-9.0	+2.7	+7.5	-2.1	**-33.2*****	-4.4
Surbuban									
Cohort 1 (1985-86/1986-87)	38.3	37.6	28.1	33.0	38.8	37.6	36.7	20.7	36.5
	(2.5)	(3.5)	(2.5)	(3.2)	(3.5)	(4.9)	(3.9)	(3.6)	(5.7)
Cohort 2 (2000-01)	56.0	64.2	52.2	59.7	50.0	43.3	57.2	65.7	57.6
	(3.1)	(3.0)	(3.2)	(3.8)	(3.6)	(4.6)	(3.4)	(2.5)	(3.4)
Percentage-point change	**+17.7*****	**+26.6*****	**+24.1*****	**+26.7*****	**+11.2***	+5.7	**+20.5*****	**+45.0*****	**+21.1****
Rural									
Cohort 1 (1985-86/1986-87)	34.7	34.5	49.8	27.4	18.6	24.5	22.8	23.5	33.9
	(2.5)	(3.4)	(2.8)	(3.0)	(2.8)	(4.3)	(3.4)	(3.8)	(5.6)
Cohort 2 (2000-01)	14.2	9.5	21.0	9.6	10.1	11.4	4.3	11.7	17.2
	(2.2)	(1.8)	(2.6)	(2.3)	(2.2)	(3.0)	(1.4)	(1.7)	(2.6)
Percentage-point change	**-20.5*****	**-25.0*****	**-28.8*****	**-17.6*****	**-8.5***	**-13.1***	**-18.5*****	**-11.8****	**-16.7****

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Students with learning disabilities or speech impairments show no significant increases in attendance at regular schools, largely because the vast majority of them already were attending such schools in cohort 1. Attendance at regular schools was much lower for cohort 1 students with visual impairments (68%) and did not increase significantly over time; only about three-fourths of cohort 2 students with visual impairments attended regular schools. Neither is a significant increase noted for students with emotional disturbances or other health impairments, who also had relatively lower rates of attending regular schools in cohort 1.

The small but statistically significant change in attendance at alternative or continuation schools that is observed for students with disabilities as a whole occurred largely as a result of declines of 2 and 3 percentage points on the part of students with emotional disturbances or visual impairments ($p<.001$).

The sizable shift from rural to suburban communities that was depicted among students with disabilities as a whole in Exhibit 2-1 is found among students in most disability categories. Declines in attending schools in rural areas range from 8 to 29 percentage points across categories ($p<.05$ to $p<.001$). Significant increases in attending schools in suburban areas range from 11 to 45 percentage points; no significant change is noted for cohort 2 students with visual impairments, who were the least likely to be attending schools in suburban areas. The largest increase in suburban school attendance occurred for students with other health impairments (45 percentage points, $p<.001$). This increase reflects a 33-percentage-point decline in urban school attendance for these students, the only group to show such a decrease, and a 12-percentage-point decline in attending schools in rural areas.[8]

Changes in Student Body Characteristics

Exhibits 2-2 through 2-4 demonstrated a variety of changes in the characteristics of the student bodies in schools attended by students with disabilities as a whole. The following sections describe differences in those changes across primary disability categories.

Enrollment. The substantial increase in the average enrollment in schools attended by students with disabilities that occurred for the group as a whole (presented in Exhibit 2-2) is evident in six of nine disability categories (Exhibit 2-8). The average enrollment in schools attended by these groups shows increases ranging from 179 to 292 students ($p<.05$ to $p<.001$). In contrast, the group of students who attended the largest schools in cohort 1—those with other health impairments—show a significant decline of 303 students in the average size of their schools ($p<.001$). No change is evident in the average size of schools attended by students with visual or orthopedic impairments. Because of the changes described here, cohort 2 students are more similar across disability categories in the size of the schools they attended than was true for cohort 1 students.

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[8] It is important to note that the composition of this disability category also has experienced a significant change over time. The incidence of attention deficit/attention deficit-hyperactivity disorder (ADHD) has increased markedly; students with ADHD as their primary disability generally are included in this category. And although students with autism now are included in a separate category, generally they were included in the other health impairment category in 1986 and thus have been combined with that category in these analyses. Students with ADHD and autism are more likely than students with other disabilities to be white (see Marder, Levine, & Wagner, 2003).

Racial/ethnic background. The overall stability in the average proportion of the student body who were white in schools attended by students with disabilities as a whole (presented in Exhibit 2-3) is mirrored in the pattern across disability categories (Exhibit 2-8). In fact, the only significant changes involve increases of 21 and 10 percentage points for students with other health impairments or multiple disabilities, respectively ($p.<001$ and $p<.05$). The increase for students with other health impairments mirrors changes in the students in that category themselves; they were significantly more likely to be white in cohort 2 than in cohort 1 (Wagner, Cameto, et al., 2003).

Poverty status. The trend that students with disabilities increasingly attended schools with higher concentrations of students in poverty (presented in Exhibit 2-3) applies to only three disability groups: learning disability, mental retardation, and visual impairment. Compared with cohort 1, cohort 2 students in those categories were significantly more likely to attend schools where more than one-fourth of students were eligible for the NSLP; increases range from 8 to 16 percentage points, $p<.05$). In contrast, a significant decrease of 12 percentage points ($p<.05$) is evident for students with other health impairments attending schools with relatively high concentrations of students in poverty, consistent with the decline in the minority population in their schools.

Students with disabilities. As noted for the population of students with disabilities as a whole (presented in Exhibit 2-4), the average percentage of the student body in their schools who received special education services was largely stable over time. However, the stable average masks a decline in most categories in the proportion of students attending schools where both 5% or fewer and more than 75% of the student body were students with disabilities. Significant declines of from 6 to 22 percentage points in the proportion of students attending schools where they were very small proportions of the student body have occurred across all categories except multiple disabilities ($p<.05$ to $p<.001$), reducing dramatically the variation across categories in their likelihood of attending such schools. Students with multiple disabilities have experienced a 31-percentage-point decline in attending schools where students with disabilities were the large majority of the student body, consistent with their large reduction in enrollment in special schools. Significant declines of 9 percentage points also are noted for students with mental retardation or hearing or other health impairments ($p<.05$ to $p<.001$).

Exhibit 2-8
CHANGES IN STUDENT BODY CHARACTERISTICS OF SCHOOLS ATTENDED, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Average enrollment									
Cohort 1 (1985-86/1986-87)	1,001 (33)	1,070 (51)	756 (30)	928 (42)	959 (46)	951 (71)	1,240 (67)	1,449 (82)	604 (72)
Cohort 2 (2000-01)	1,258 (46)	1,276 (53)	1,031 (42)	1,134 (61)	1,138 (60)	1,056 (80)	1,317 (55)	1,146 (35)	896 (43)
Difference in enrollment	**+257*** **	**+206** **	**+275*** **	**+206** **	**+179***	105	77	**-303*** **	**+292*** **
Average percentage of student body who were white									
Cohort 1 (1985-86/1986-87)	71.8 (1.7)	62.6 (2.6)	69.7 (1.8)	70.0 (2.0)	66.5 (1.7)	69.9 (2.4)	62.6 (2.7)	50.6 (3.3)	62.9 (3.5)
Cohort 2 (2000-01)	67.2 (2.0)	68.3 (2.0)	66.0 (2.2)	65.1 (2.5)	63.9 (2.1)	63.9 (2.8)	63.5 (2.2)	72.0 (1.5)	72.6 (2.0)
Percentage-point change	-5.6	+5.7	-3.7	-4.9	-2.6	-6.0	+.9	**+21.4*****	**+9.7***
Percentage in schools with more than 25% of the student body eligible for free or reduced-price lunches									
Cohort 1 (1985-86/1986-87)	43.6 (2.6)	55.8 (3.6)	59.6 (2.7)	50.4 (3.3)	51.2 (3.0)	51.2 (4.3)	48.9 (4.0)	54.5 (4.6)	65.2 (5.3)
Cohort 2 (2000-01)	46.3 (3.2)	52.5 (3.1)	32.0 (3.0)	46.1 (4.0)	41.9 (3.6)	33.3 (4.5)	45.3 (3.5)	57.7 (2.7)	45.5 (3.5)
Percentage-point change	**+10.1***	-8.3	+**8.4***	+3.5	+6.9	**+15.5***	+5.8	**-12.2***	-10.7
Percentage in schools where students receiving special education services were:									
Fewer than 5% of the student body									
Cohort 1 (1985-86/1986-87)	17.3 (2.1)	13.7 (2.5)	7.7 (1.5)	14.8 (2.4)	12.7 (2.0)	13.0 (2.7)	11.5 (2.6)	24.0 (4.0)	3.5 (2.0)
Cohort 2 (2000-01)	4.6 (1.3)	2.6 (1.0)	1.7 (.8)	4.2 (1.6)	5.4 (1.6)	2.2 (1.4)	3.6 (1.3)	2.4 (.8)	4.0 (1.3)
Percentage-point change	**-12.7*** **	**-11.1*** **	**-6.0*** **	**-10.6*** **	**-7.3** **	**-10.8*** **	**-7.9** **	**-22.2*** **	+.5
More than 75% of the student body									
Cohort 1 (1985-86/1986-87)	3.1 (.9)	3.9 (1.4)	15.4 (2.1)	12.6 (2.2)	30.8 (2.8)	30.3 (3.7)	11.5 (2.6)	6.2 (2.3)	45.8 (5.3)
Cohort 2 (2000-01)	.3 (.3)	.8 (.6)	6.1 (1.5)	10.6 (2.4)	21.5 (3.0)	23.5 (4.0)	2.9 (1.2)	2.9 (.9)	14.8 (2.4)
Percentage-point change	-2.8	-3.1	**-9.3*** **	-2.0	**-9.3***	-6.8	**-8.6** **	-3.3	**-31.0*** **

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Changes in School Programs and Placement Options

The declines in the availability of Title I programs in schools that occurred for students with disabilities as a whole (presented in Exhibit 2-5) are evident for students in all categories (Exhibit 2-9), ranging from 11 to 24 percentage points ($p<.05$ to $p<.001$); between about one-fourth and one-third of cohort 2 students with disabilities across categories attended schools with a Title I program. Increases in the prevalence of ESL programs are significant for students in five disability categories, ranging from 12 to 18 percentage points ($p<.05$ to $p<.001$).

Exhibit 2-9
CHANGES IN SELECTED PROGRAMS AND PLACEMENT OPTIONS, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage in schools with:									
A Title I program									
Cohort 1 (1985-86/1986-87)	50.0 (2.6)	41.5 (3.5)	50.9 (2.7)	52.8 (3.2)	52.7 (3.0)	51.4 (4.1)	51.7 (4.0)	47.5 (4.4)	47.8 (5.3)
Cohort 2 (2000-01)	30.7 (2.9)	30.1 (2.8)	30.3 (2.9)	30.0 (3.5)	34.1 (3.4)	31.6 (4.3)	28.1 (3.1)	25.6 (2.3)	35.3 (3.3)
Percentage-point change	**-19.3*** **	**-11.4***	**-20.6*** **	**-22.8*** **	**-18.6*** **	**-19.8*** **	**-23.6*** **	**-21.9*** **	**-12.5***
An English as a second language program									
Cohort 1 (1985-86/1986-87)	41.4 (2.5)	40.9 (3.5)	28.9 (2.5)	48.0 (3.2)	37.2 (2.9)	36.6 (4.0)	56.8 (4.0)	57.1 (4.4)	35.5 (5.1)
Cohort 2 (2000-01)	58.7 (3.1)	56.1 (3.1)	42.9 (3.1)	53.2 (3.9)	49.1 (3.6)	54.5 (4.7)	63.4 (3.3)	56.8 (2.7)	42.6 (3.4)
Percentage-point change	**+17.3*** **	**+15.2*** **	**+14.0*** **	+5.2	**+11.9***	**+17.9** **	+6.6	-.3	+7.1
Percentage in schools with self-contained special education classroom available for students with disabilities									
Cohort 1 (1985-86/1986-87)	68.5 (2.6)	74.0 (3.4)	72.0 (2.9)	66.3 (3.6)	79.5 (3.4)	71.2 (4.9)	80.9 (3.7)	74.3 (4.5)	82.1 (7.1)
Cohort 2 (2000-01)	86.2 (2.2)	83.8 (2.3)	89.9 (2.0)	84.1 (2.9)	87.1 (2.9)	92.9 (3.0)	93.1 (1.8)	89.1 (1.7)	91.5 (2.1)
Percentage-point change	**+17.7*** **	**+9.8***	**+17.9*** **	**+17.8** **	+7.6	**+21.7*** **	**+12.2** **	**+14.8** **	+9.4

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Note: Only factors for which there was a significant change for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

The lack of significant changes in access to general education inclusion programs or special education resource rooms for students with disabilities as a whole is mirrored in the changes across categories, none of which attain statistical significance; the vast majority of students with disabilities in both cohorts went to schools with these placement options. Sizable increases in the availability of self-contained special education classrooms occurred for students in all categories except hearing impairment and multiple disabilities. Between 84% and 93% of cohort 2 students had self-contained classes available in their schools, representing increases ranging from 10 percentage points among students with speech impairments ($p<.05$) to 22 percentage points among students with visual impairments ($p<.001$).

Changes in Community Resources

The kinds of changes in the resources available in the communities of students in different disability categories varies with the kind of community resource (Exhibit 2-10).[9] For example, the significant increase in access to alternative or continuation schools noted for students with disabilities as a whole (presented in Exhibit 2-6) occurred for students in all categories, a change that might reflect the sizable move from rural to suburban schools that also occurred across all categories. In contrast, a decrease in the likelihood of attending school in a community that had a special school that served only students with disabilities is evident for students in only four categories. Although no significant change is evident in the prevalence of transportation accommodations in communities for students with disabilities as a whole, a significant increase occurred for students with speech impairments or mental retardation (14 and 10 percentage points, $p<.01$ and $p<.05$); no categories of students show a significant change in the availability of publicly supported job training programs.

Overall, students with learning disabilities, speech impairments, mental retardation, or emotional disturbances show the greatest overall increases in resources in their communities, with significant increases occurring in six or eight of the resources investigated in NLTS and NLTS2. In contrast, students with hearing or other health impairments show a significant increase in only one resource.

[9] As noted earlier in this chapter, some apparent increases in community resources may result from a difference between the two studies in the wording of the questionnaire items regarding the community surrounding the school. If the geographic area referred to in NLTS2 ("in this community, e.g., within 20 miles") was larger than what respondents in NLTS considered their "community," a higher prevalence of some programs could result.

Exhibit 2-10
CHANGES IN COMMUNITY RESOURCES AVAILABLE, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage attending schools in communities that had:									
A school only for students with disabilities									
Cohort 1 (1985-86/1986-87)	64.2 (2.7)	64.3 (3.8)	60.5 (3.1)	76.0 (3.0)	74.7 (2.8)	72.6 (4.0)	68.4 (4.1)	72.4 (4.6)	76.6 (5.2)
Cohort 2 (2000-01)	57.9 (3.7)	65.9 (3.5)	59.4 (4.0)	64.3 (4.4)	67.1 (4.8)	48.8 (7.1)	66.9 (4.0)	55.4 (3.3)	58.1 (4.7)
Percentage-point change	-6.3	+1.6	-1.1	**-11.7***	-7.6	**-23.8****	-1.5	**-17.0****	**-18.5****
An alternative school									
Cohort 1 (1985-86/1986-87)	61.3 (2.8)	61.3 (3.9)	56.8 (3.1)	69.2 (3.3)	71.8 (3.2)	71.8 (4.4)	67.2 (4.2)	72.9 (4.6)	68.3 (5.8)
Cohort 2 (2000-01)	95.0 (1.5)	96.1 (1.4)	94.8 (1.6)	94.3 (1.9)	92.9 (2.1)	95.8 (2.1)	95.7 (1.6)	94.5 (1.4)	95.5 (1.7)
Percentage-point change	**+33.7*****	**+34.8*****	**+38.0*****	**+25.1*****	**+21.1*****	**+24.0*****	**+28.5*****	**+21.6*****	**+27.2*****
A vocational-technical secondary school									
Cohort 1 (1985-86/1986-87)	70.2 (2.6)	66.6 (3.7)	73.0 (2.7)	79.9 (2.8)	78.8 (2.7)	78.3 (3.8)	73.1 (3.9)	66.8 (5.0)	70.3 (5.6)
Cohort 2 (2000-01)	79.4 (2.9)	82.8 (2.7)	84.6 (2.7)	84.4 (3.1)	86.3 (2.7)	82.0 (4.2)	75.6 (3.4)	81.7 (2.4)	83.8 (3.1)
Percentage-point change	**+9.2***	**+16.2*****	**+11.6*****	+4.5	+7.5	+3.7	+2.5	**+14.9****	**+13.5***
A magnet school									
Cohort 1 (1985-86/1986-87)	28.2 (2.6)	23.2 (3.5)	19.9 (2.6)	26.8 (3.3)	37.2 (3.3)	41.2 (4.6)	32.5 (4.3)	52.2 (5.2)	38.4 (6.3)
Cohort 2 (2000-01)	38.0 (3.8)	44.0 (3.8)	32.2 (4.0)	44.3 (4.7)	48.7 (3.9)	46.8 (5.7)	45.0 (4.0)	39.9 (3.4)	41.8 (4.6)
Percentage-point change	**+9.8***	**+20.8*****	**+12.3***	**+17.5*****	**+11.5***	+5.6	**+12.5***	**-12.3***	-3.4
A work facility for adults with disabilities									
Cohort 1 (1985-86/1986-87)	80.5 (2.2)	81.2 (3.0)	83.6 (2.2)	90.5 (2.1)	94.7 (1.5)	90.7 (2.6)	95.0 (1.9)	90.3 (3.1)	82.9 (4.6)
Cohort 2 (2000-01)	92.7 (1.9)	88.6 (2.3)	90.9 (2.1)	95.0 (1.9)	93.4 (2.0)	96.2 (2.0)	96.1 (1.6)	89.6 (1.9)	94.7 (1.9)
Percentage-point change	**+12.2*****	+7.4	**+7.3***	+4.5	-1.3	+5.5	+1.1	-.7	**+11.8***
A group home									
Cohort 1 (1985-86/1986-87)	77.1 (2.4)	77.7 (3.4)	77.3 (2.6)	80.4 (2.9)	85.7 (2.4)	83.1 (3.4)	77.7 (3.8)	85.4 (3.8)	84.2 (4.5)
Cohort 2 (2000-01)	91.9 (2.1)	91.9 (2.1)	86.7 (2.6)	93.7 (2.2)	90.7 (2.4)	91.2 (3.2)	94.2 (1.9)	92.5 (1.8)	95.3 (1.9)
Percentage-point change	**+14.8*****	**+14.2*****	**+9.4***	**+13.3*****	+5.0	**+8.1***	**+16.5***	+7.1	+11.1
A center for independent living									
Cohort 1 (1985-86/1986-87)	60.6 (3.0)	59.5 (4.3)	57.7 (3.3)	68.8 (3.6)	77.6 (3.0)	75.2 (4.2)	66.9 (4.3)	74.9 (5.2)	68.6 (6.2)
Cohort 2 (2000-01)	79.8 (3.1)	78.2 (3.2)	78.5 (3.3)	85.7 (3.3)	85.8 (3.0)	88.5 (3.9)	76.1 (3.7)	76.9 (2.8)	86.2 (3.0)
Percentage-point change	**+18.8*****	**+18.7****	**+20.8*****	**+16.9****	+8.2	**+13.3***	+9.2	+2.0	**+17.6***

Exhibit 2-10
CHANGES IN COMMUNITY RESOURCES AVAILABLE, BY DISABILITY CATEGORY (Concluded)

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage attending schools in communities that had:									
Advocacy groups for persons with disabilities									
Cohort 1 (1985-86/1986-87)	85.1 (2.1)	86.6 (2.8)	85.4 (2.2)	88.9 (2.3)	97.4 (1.0)	90.3 (2.7)	93.7 (2.2)	92.3 (2.8)	91.1 (3.5)
Cohort 2 (2000-01)	95.3 (1.6)	98.3 (.9)	94.3 (1.8)	96.8 (1.5)	98.5 (1.0)	97.0 (1.8)	96.8 (1.4)	95.1 (1.3)	90.9 (2.4)
Percentage-point change	**+10.2*** **	**+11.7*** **	**+8.9** **	**+7.9** **	+.9	**+6.7***	+3.1	+2.8	-.2
Support groups for persons with disabilities									
Cohort 1 (1985-86/1986-87)	80.6 (2.4)	82.8 (3.2)	80.1 (2.6)	84.0 (2.7)	91.2 (2.0)	89.2 (2.9)	80.6 (3.4)	85.1 (4.1)	87.2 (4.2)
Cohort 2 (2000-01)	93.1 (1.9)	98.2 (1.0)	86.9 (2.6)	93.9 (2.1)	96.1 (1.6)	94.5 (2.5)	93.8 (1.9)	93.3 (1.6)	93.8 (2.1)
Percentage-point change	**+12.5*** **	**+15.4*** **	+6.8	**+9.9** **	+4.9	+5.2	**+13.2** **	+8.2	+6.6
Transportation accommodations									
Cohort 1 (1985-86/1986-87)	79.5 (2.4)	72.3 (3.7)	67.8 (3.0)	80.6 (2.9)	84.2 (2.5)	77.0 (3.9)	89.9 (2.8)	80.6 (4.2)	75.9 (5.4)
Cohort 2 (2000-01)	81.7 (2.9)	85.9 (2.6)	77.5 (3.2)	84.0 (3.3)	84.0 (2.9)	86.2 (3.7)	84.1 (2.9)	78.0 (2.7)	80.7 (3.5)
Percentage-point change	+2.2	**+13.6** **	**+9.7***	+3.4	-.2	+9.2	-5.8	-2.6	+4.8

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Note: Only factors for which there was a significant change for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Differential Changes in School Characteristics across Demographic Groups

It is reasonable to expect that the kinds of changes in the characteristics of schools attended by students with disabilities that have been described thus far could be associated differentially with students with different demographic characteristics. Because boys and girls generally attend the same kinds of schools, changes in the characteristics of those schools could be expected to occur for them similarly, and they did. However, some kinds of changes occurred to different degrees for students with disabilities who differed in income and racial/ethnic background, as described below.

Changes in the Types and Locations of Schools Attended

The small but significant increase in the extent to which students with disabilities as a whole attended regular secondary schools occurred largely among students in the highest income group[10] and those who were white (7 and 4 percentage points respectively, p<.01; Exhibit 2-11).

Exhibit 2-11
CHANGES IN TYPES AND LOCATIONS OF SCHOOLS ATTENDED BY STUDENTS WITH DISABILITIES, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity		
	Lowest	Middle	Highest	White	African American	Hispanic
Percentage attending:						
Regular secondary school						
Cohort 1 (1985-86/1986-87)	88.4 (2.5)	90.8 (2.0)	89.5 (1.8)	91.4 (1.2)	86.7 (2.8)	81.9 (5.3)
Cohort 2 (2000-01)	91.6 (2.1)	92.2 (2.2)	96.2 (1.5)	95.9 (1.0)	89.0 (3.0)	90.6 (4.1)
Percentage-point change	+3.2	+1.4	**+6.7****	**+4.5****	+2.3	+8.7
Special school only for students with disabilities						
Cohort 1 (1985-86/1986-87)	6.5 (2.0)	5.3 (1.6)	8.1 (1.6)	6.1 (1.0)	7.9 (2.2)	8.9 (3.9)
Cohort 2 (2000-01)	3.7 (1.5)	3.1 (1.4)	1.4 (.9)	1.8 (.7)	5.5 (2.2)	2.2 (2.1)
Percentage-point change	-2.8	-2.2	**-6.7*****	**-4.3*****	-2.4	-6.7
Percentage attending school in a community that was:						
Urban						
Cohort 1 (1985-86/1986-87)	46.1 (4.0)	27.9 (3.2)	20.1 (2.4)	16.4 (1.7)	64.8 (4.0)	61.1 (6.8)
Cohort 2 (2000-01)	35.0 (3.7)	29.0 (3.7)	25.3 (3.5)	20.4 (2.0)	47.2 (4.7)	48.6 (7.1)
Percentage-point change	**-11.1***	+1.1	+5.2	+4.0	**-17.6****	-12.5
Suburban						
Cohort 1 (1985-86/1986-87)	19.0 (3.2)	33.2 (3.4)	48.4 (3.0)	44.0 (2.2)	15.6 (3.1)	14.1 (4.8)
Cohort 2 (2000-01)	46.6 (3.8)	56.7 (4.0)	62.9 (3.9)	62.2 (2.4)	44.4 (4.7)	47.8 (7.1)
Percentage-point change	**+27.6*****	**+23.5*****	**+14.5****	**+18.2*****	**+28.8*****	**+33.7*****
Rural						
Cohort 1 (1985-86/1986-87)	34.8 (3.8)	39.0 (3.5)	31.5 (2.8)	39.6 (2.2)	19.6 (3.4)	24.7 (6.0)
Cohort 2 (2000-01)	18.4 (3.0)	14.3 (2.9)	11.8 (2.6)	17.3 (1.9)	8.4 (2.6)	3.6 (2.6)
Percentage-point change	**-16.4*****	**-24.7*****	**-19.8*****	**-22.3*****	**-11.2****	**-21.1****

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Note: Only factors for which there was a significant change for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

[10] Because inflation has caused household incomes to increase over time, the income categories used in these analyses are not defined by specific dollar amounts. Rather, the three groups are the lowest, middle, and highest third of the income distribution among cohort 1 and cohort 2 students.

Declines of similar sizes in the rates of attending special schools that serve only students with disabilities are also evident for these students. There are no differences across income or racial/ethnic groups in rates of attending other kinds of schools.

Changes in the kind of community in which students with disabilities attended schools also occurred differentially across income and racial/ethnic groups. The absence of a significant change in attendance at urban schools that is noted for students with disabilities as a whole masks a significant decline in urban-school attendance among African-American students with disabilities (18 percentage points, $p<.01$), the group most likely to be attending urban schools in cohort 1. Even with this decline over time, cohort 2 African-American and Hispanic students both were significantly more likely than white students to attend urban schools (47% and 49% vs. 20%, $p<.001$ for both comparisons).

Attendance at suburban schools increased significantly among all income and racial/ethnic groups, although students in the lowest and middle income groups show greater increases (28 and 24 percentage points, $p<.001$) than those in the highest income group (14 percentage points, $p<.01$). African-American and Hispanic students also show greater increases (29 and 34 percentage points, $p<.001$) than white students (18 percentage points, $p<.001$). Nonetheless, cohort 2 students in the highest income group and white students continued to be the most likely to go to suburban schools. The increase in suburban school attendance corresponds to a significant decline in attending schools in rural areas for all groups, although the decline smallest for African-American students with disabilities.

Changes in Student Body Characteristics

A significant increase in the average enrollment in schools attended by students with disabilities occurred for all income groups, ranging from an average enrollment increase of 187 students among those in the lowest income group ($p<.05$) to 315 for the highest income group ($p<.001$; Exhibit 2-12). Increases range from an average of 186 to 245 students across racial/ethnic groups ($p<.05$ and $p<.001$).

Although no significant decrease is evident in the average proportion of the student body who were white in schools attended by students with disabilities as a whole, decreases are noted among those in the highest income group (5 percentage points, $p<.05$) and among white students (4 percentage points, $p<.01$). However, cohort 2 white students, as well as those in the middle and highest income groups, continued to attend schools with significantly higher proportions of white students than other groups. Increases in the proportion of the student body who were eligible for free or reduced-price lunches occurred only in schools attended by students in the middle income group. African Americans are the only racial/ethnic group with a significant increase in this measure (12 percentage points, $p<.05$).

As with the full population of students with disabilities, there are no differences across income or racial/ethnic groups in the average proportion of the student body that students with disabilities comprised. However, significant reductions are evident both in attendance at schools in which 5% or fewer of the student population were receiving special education and attendance at schools in which more than 75% of the student population were receiving special education. Reductions in attending schools where students with disabilities were a very small proportion of the student body occurred across all income and racial/ethnic groups. However, decreases in

attendance at schools where students with disabilities were the large majority of the student body occurred only among students in the highest income group (8 percentage points, p<.001) and among white and Hispanic students (5 and 14 percentage points, respectively, p<.001 and p<.05).

Exhibit 2-12
CHANGES IN STUDENT BODY CHARACTERISTICS OF SCHOOLS ATTENDED BY STUDENTS WITH DISABILITIES, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity		
	Lowest	Middle	Highest	White	African American	Hispanic
Average enrollment						
Cohort 1 (1985-86/1986-87)	937 (54)	936 (45)	971 (41)	883 (28)	1,061 (55)	1,375 (18)
Cohort 2 (2000-01)	1,124 (59)	1,173 (58)	1,286 (59)	1,128 (34)	1,248 (74)	1,561 (24)
Difference in enrollment	**+187***	**+237*****	**+315*****	**+245*****	**+187***	**+186*****
Average percentage of student body who were white						
Cohort 1 (1985-86/1986-87)	57.0 (3.0)	72.3 (2.2)	79.1 (1.5)	84.3 (.9)	40.8 (2.6)	26.4 (4.0)
Cohort 2 (2000-01)	59.0 (2.8)	67.8 (2.6)	73.8 (2.2)	80.2 (1.1)	41.8 (3.0)	36.2 (4.3)
Percentage-point change	+2.0	-4.5	**-5.3***	**-4.1****	+1.0	+9.8
Percentage attending schools with more than 25% of student body who were eligible for free or reduced-price lunch						
Cohort 1 (1985-86/1986-87)	69.1 (3.7)	40.5 (3.5)	35.8 (2.9)	39.1 (2.2)	66.7 (4.0)	72.1 (6.3)
Cohort 2 (2000-01)	76.3 (3.3)	56.8 (4.1)	38.0 (4.0)	45.1 (2.5)	78.4 (3.9)	73.3 (6.4)
Percentage-point change	+7.2	**+13.3****	+2.2	+6.0	**+11.7***	+1.2
Percentage attending schools where students receiving special education were:						
5% or fewer of the student body						
Cohort 1 (1985-86/1986-87)	12.3 (2.8)	15.2 (2.7)	18.6 (2.4)	16.1 (1.7)	13.3 (2.9)	17.3 (5.4)
Cohort 2 (2000-01)	4.1 (1.6)	4.2 (1.7)	4.4 (1.7)	3.9 (1.0)	3.8 (1.8)	4.5 (3.0)
Percentage-point change	**-8.2***	**-11.0*****	**-14.2*****	**-12.2*****	**-9.5****	**-12.8***
More than 75% of the student body						
Cohort 1 (1985-86/1986-87)	8.8 (2.4)	6.6 (1.9)	9.6 (1.8)	7.3 (1.2)	8.9 (2.4)	16.6 (5.3)
Cohort 2 (2000-01)	3.9 (1.5)	3.1 (1.4)	1.7 (1.1)	2.1 (.7)	5.9 (2.2)	2.3 (2.1)
Percentage-point change	-4.8	-3.5	**-7.9*****	**-5.2*****	-3.0	**-14.3***

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Changes in School Programs and Placement Options

White and African-American students with disabilities show changes in programs and placements to significant and usually similar degrees (Exhibit 2-13). These groups show decreases of 20 percentage points in their likelihood of going to schools with Title I programs ($p<.001$ and $p<.01$) and increases of 14 percentage points in the availability of ESL programs ($p<.001$ and $p<.05$). Nonetheless, the increases in availability of ESL programs resulted in cohort 2 white and African-American students still being much less likely to go to schools with such programs (51% and 57%) than Hispanic students (81%, $p<.001$ and $p<.05$).

Exhibit 2-13
CHANGES IN PROGRAMS AND PLACEMENT OPTIONS IN SCHOOLS ATTENDED BY STUDENTS WITH DISABILITIES, BY RACE/ETHNICITY

	White	African American	Hispanic
Percentage in schools with:			
Title I program			
Cohort 1 (1985-86/1986-87)	49.2 (2.2)	46.7 (4.1)	50.9 (6.9)
Cohort 2 (2000-01)	29.6 (2.3)	27.0 (4.2)	43.8 (7.0)
Percentage-point change	**-19.6*** **	**-19.7** **	-7.1
English as a second language program			
Cohort 1 (1985-86/1986-87)	36.6 (2.1)	42.5 (4.1)	70.9 (6.2)
Cohort 2 (2000-01)	51.0 (2.5)	56.7 (4.7)	80.7 (5.6)
Percentage-point change	**+14.5*** **	**+14.2** *	+9.8
Percentage attending schools with self-contained special education classrooms			
Cohort 1 (1985-86/1986-87)	66.5 (2.3)	73.0 (4.4)	89.4 (4.8)
Cohort 2 (2000-01)	85.3 (1.8)	89.2 (3.1)	91.0 (4.2)
Percentage-point change	**+18.8*** **	**+16.2** **	+1.6

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Note: Only factors for which there was a significant change for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Changes in Community Resources

Although no significant changes are evident across income or racial/ethnic groups in students having access to publicly supported job training programs or transportation accommodations in the communities in which they attended school, significant changes regarding other resources occurred differentially across groups (Exhibit 2-14). Increases in resources were considerably more likely in the communities of students in the middle and highest income groups than in those of students in the lowest income group. Significant increases are evident for the middle and highest income groups for eight and six of the nine resources reported in Exhibit 2-14, respectively. This compares with significant increases in two resources for the lowest income group. The highest income group is the only one to show a significant decline in a resource—a special school for students with disabilities (12 percentage points, $p<.01$). Increases in the resources available in their communities were by far more likely for white students than for others. Although no significant changes over time are evident in the availability of special schools for students with disabilities in any racial/ethnic group, all other resources show significant increases in the communities in which white students attended school, ranging from 10 to 38 percentage points,

p<.01 or p<.001). In contrast, only the availability of an alternative or continuation school and a center for independent living increased for African-American students (20 and 13 percentage points, p<.001 and p<.05), and only the availability of a group home increased for Hispanic students (15 percentage points, p<.05).

Exhibit 2-14
CHANGES IN COMMUNITY RESOURCES AVAILABLE TO STUDENTS WITH DISABILITIES, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity		
	Lowest	Middle	Highest	White	African American	Hispanic
Percentage attending school in communities with:						
A special school for students with disabilities						
Cohort 1 (1985-86/1986-87)	67.6 (4.2)	57.9 (3.9)	66.2 (3.1)	61.1 (2.3)	75.9 (4.1)	74.5 (6.5)
Cohort 2 (2000-01)	58.0 (4.8)	62.9 (4.7)	54.1 (4.7)	55.9 (2.9)	69.2 (5.5)	64.4 (8.2)
Percentage-point change	-9.6	+5.0	**-12.1***	-5.2	-6.7	-10.1
An alternative or continuation school						
Cohort 1 (1985-86/1986-87)	71.0 (4.2)	59.6 (3.9)	63.2 (3.1)	56.2 (2.4)	76.7 (4.1)	86.0 (5.2)
Cohort 2 (2000-01)	95.2 (1.9)	95.1 (1.9)	94.0 (2.1)	94.7 (1.2)	96.7 (1.9)	93.2 (3.9)
Percentage-point change	**+24.2*****	**+35.5*****	**+30.8*****	**+38.5*****	**+20.0*****	+7.2
A secondary vocational-technical school						
Cohort 1 (1985-86/1986-87)	75.3 (3.9)	66.2 (3.7)	73.2 (2.9)	69.6 (2.2)	82.6 (3.6)	62.3 (7.2)
Cohort 2 (2000-01)	80.5 (3.5)	80.4 (3.6)	79.4 (3.7)	80.1 (2.2)	87.4 (3.7)	75.6 (6.8)
Percentage-point change	+5.2	**+14.2****	+6.2	**+10.5*****	+5.2	+13.3
Percentage attending school in communities with:						
A magnet school						
Cohort 1 (1985-86/1986-87)	41.1 (4.5)	26.2 (3.6)	20.9 (2.7)	18.7 (1.9)	56.5 (4.8)	50.9 (7.7)
Cohort 2 (2000-01)	38.3 (4.7)	37.6 (4.9)	37.7 (4.9)	30.5 (2.9)	59.7 (5.8)	49.0 (8.4)
Percentage-point change	-.8	**+13.2***	**+12.5***	**+11.0****	+5.6	-5.8
An advocacy group for persons with disabilities						
Cohort 1 (1985-86/1986-87)	86.9 (3.1)	83.3 (3.0)	88.4 (2.1)	82.0 (1.9)	96.3 (1.8)	96.4 (3.1)
Cohort 2 (2000-01)	93.6 (2.2)	94.9 (2.1)	96.7 (1.6)	94.1 (1.3)	98.5 (1.4)	98.3 (2.1)
Percentage-point change	+6.7	**+11.6****	**+8.3****	**+12.1*****	+2.2	+1.9

Exhibit 2-14
CHANGES IN COMMUNITY RESOURCES AVAILABLE TO STUDENTS WITH DISABILITIES, BY INCOME AND RACE/ETHNICITY (Concluded)

	Income			Race/Ethnicity		
	Lowest	Middle	Highest	White	African American	Hispanic
Percentage attending school in communities with (concluded):						
A support group for persons with disabilities						
Cohort 1 (1985-86/1986-87)	83.1 (3.6)	77.9 (3.4)	80.2 (2.7)	77.0 (2.1)	93.9 (2.4)	82.6 (6.3)
Cohort 2 (2000-01)	86.0 (3.3)	94.6 (2.1)	95.8 (1.9)	92.8 (1.5)	90.8 (3.4)	94.4 (3.8)
Percentage-point change	+2.9	**+16.7*** **	**+15.6*** **	**+15.8*** **	-3.1	+11.8
A work facility for adults with disabilities						
Cohort 1 (1985-86/1986-87)	81.4 (3.5)	81.1 (3.0)	84.1 (2.4)	79.3 (1.9)	88.6 (3.0)	91.7 (4.3)
Cohort 2 (2000-01)	91.8 (2.5)	94.5 (2.1)	90.8 (2.7)	91.4 (1.6)	93.9 (2.7)	96.2 (3.2)
Percentage-point change	**+10.4***	**+13.4*** **	+6.7	**+11.1*** **	+5.3	+4.5
A group home						
Cohort 1 (1985-86/1986-87)	79.9 (3.7)	74.7 (3.5)	80.2 (2.6)	73.5 (2.1)	90.3 (2.9)	83.9 (5.8)
Cohort 2 (2000-01)	87.8 (3.1)	91.8 (2.6)	93.6 (2.4)	90.0 (1.8)	92.7 (3.0)	98.6 (2.1)
Percentage-point change	+7.9	**+17.1*** **	**+13.4*** **	**+16.5*** **	+2.4	**+14.7***
A center for independent living						
Cohort 1 (1985-86/1986-87)	70.9 (4.4)	58.2 (4.2)	64.2 (3.4)	58.8 (2.5)	74.2 (4.6)	74.4 (7.7)
Cohort 2 (2000-01)	77.1 (4.2)	83.9 (3.7)	76.9 (4.2)	77.1 (2.6)	86.9 (4.1)	87.0 (5.8)
Percentage-point change	+6.2	**+25.7*** **	**+12.7***	**+18.3*** **	**+12.7***	+12.6

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Note: Only factors for which there was a significant change for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: * p<.05, ** p<.01, *** p<.001.

Summary

The changes in the characteristics of schools attended by students with disabilities that are described in this chapter reflect a variety of changes in both special and general education policy and practice and shifts in the demographics of the general school population, as summarized below.

Indications of the Inclusion Movement

The Regular Education Initiative (REI), begun in the mid-1980s, and subsequent efforts associated with the inclusion movement pressed for the placement of students with disabilities in educational settings where they would have meaningful access to the general education curriculum together with their nondisabled peers. Comparisons of the secondary schools

attended by students with disabilities represented in NLTS and NLTS2 suggest that these initiatives may have contributed to changes in the context of students' secondary schooling.

There was a significant decrease in the proportion of students with disabilities attending special schools that serve only students with disabilities and a corresponding increase in their attending regular secondary schools. Consistent with this shift, there was a decline in the proportion of students with disabilities attending schools where they were the large majority of the student body. However, this potential for increased access to general education settings did not occur uniformly for all students with disabilities. The shift from special schools to regular secondary schools occurred primarily among students with mental retardation, hearing or orthopedic impairments, or multiple disabilities, including deaf-blindness. Students with hearing impairments or multiple disabilities had among the highest rates of attendance at special schools in cohort 1, leaving substantial room for change in their pattern of school attendance. However, students with visual impairments also were among the most likely to attend special schools in 1986 but they showed no significant change in attendance at either regular or special schools over time. The vast majority of cohort 1 students with learning disabilities or speech impairments already were attending regular secondary schools and showed no change in their attendance over time.

Differential changes in indications of the inclusion movement also are noted for students who differed in their socioeconomic status and racial/ethnic background. The movement away from special schools and toward regular secondary schools occurred largely among white students and those in the highest income group; they also had significant declines in attending schools where students with disabilities were the majority of the student body.

Population Shifts

The American school-age population has both grown and changed in its demographic characteristics in the decade and a half since NLTS. An increase in the suburban population nationally is reflected in a significant increase in students with disabilities attending schools in suburban communities. The average size of the schools they attended also increased, particularly among high schools, reflecting a move away from smaller, rural schools as well as a move away from special schools, which tend to be smaller than regular secondary schools. Students with disabilities in all income and racial/ethnic groups experienced the suburbanization of their schools, although the increases are largest for the lowest and middle income groups and for African-American and Hispanic students. Nonetheless, in cohort 2, those groups generally were less likely than white or upper-income students to go to school in suburban communities.

The sizable shift to suburban schools from rural areas may help explain a marked increase in the resources that reportedly were available in the communities surrounding those schools. For students with disabilities, there were significant increases in the availability of a variety of secondary and postsecondary education options (e.g., vocational-technical schools, alternative or continuation schools), supports for adult independence (e.g., group homes, centers for independent living, supported work facilities), and advocacy and support groups for persons with disabilities. Increases in community resources are most notable for students with learning disabilities and other high-incidence categories. They also are most apparent for students with disabilities in the middle and highest income groups and for white students.

Not only has the geographic distribution of the student population changed, but its racial/ethnic composition has as well. The growth in Hispanic and Asian/Pacific Islander students in the national student population is borne out in similar changes in the student bodies of schools attended by secondary school students with disabilities. A substantial increase in students attending schools that provide ESL programs is one response to the burgeoning population of students both with and without disabilities who speak a language other than English. In contrast, there was an increase in students with disabilities attending schools with higher concentrations of students in poverty, but a substantial reduction in their schools' participation in the Title I program.

In some ways, demographic shifts among students with disabilities as a whole are in sharp contrast to those observed for students with other health impairments. These students had the greatest increase in attendance at suburban schools, yet the average size of their schools decreased. And rather than their schools having a decreasing proportion of white students and an increasing proportion of students in poverty, the opposite occurred. These changes correspond to changes among the students in this category themselves—over time, they have become increasingly likely to be white and from upper-income households, a pattern of change not observed for most other categories (Wagner, Cameto, et al., 2003).

The description of changes over time in the characteristics of schools attended by students with disabilities provides a backdrop against which to depict changes in the school programs of students with disabilities, as presented in the next chapter.

3. CHANGES IN THE SCHOOL PROGRAMS OF SECONDARY SCHOOL STUDENTS WITH DISABILITIES

The Individuals with Disabilities Education Act Amendments of 1997 (IDEA '97), the No Child Left Behind Act of 2001 (NCLB), and scores of state and local initiatives culminate two decades of increasing emphasis on the improvement of American education. Schools and educators are now being held accountable for the adequate yearly progress of all students, including those with disabilities. The success of these ambitious initiatives will depend on improvements in many domains, including teacher preparation and training, assessment policies, instructional practices, standards and expectations, and funding. However, it is in students' educational programs where "the rubber meets the road." What happens in schools and classes every school day is what students experience directly and is the mechanism through which educational interventions are most likely to produce higher levels of student achievement.

This chapter describes changes since the mid-1980s in important aspects of the daily school experiences of secondary school students with disabilities, including:

- The courses they take
- The settings of those courses (i.e., general or special education)
- The related services they are provided to help them participate in and succeed at school.

For NLTS, information on these topics is drawn from the school record abstract, which was completed for NLTS sample members by a school staff person for the students' most recent year in school, either the 1985-86 or 1986-87 school year. Information for NLTS2 is taken from the student's school program survey, completed by those most knowledgeable about the overall school programs of individual students for the 2001-02 school year.

School programs are described for students with disabilities as a group and for those who differ in their primary disability category, grade level, and selected demographic characteristics, where significant.

Course Taking

Choices regarding courses taken in secondary school have important implications for student learning, school completion, and postschool opportunities. The content of courses defines the knowledge and skills students acquire, and the academic rigor of courses affects the demands placed on students to meet performance expectations. Accumulating the appropriate number and distribution of credits and demonstrating adequate performance in the requisite courses determine whether students graduate from high school and are accepted for postsecondary education. Vocational training during high school can prepare students for advanced training or employment in the postschool years.

Although course-taking choices can reflect students' interests and postsecondary aspirations, they also are influenced by larger educational policies. For example, between 1984 and 1998, 13

states raised the number of academic credits[1] required to receive a high school diploma (National Center for Education Statistics, 2001). By 1998, 26 states required students to earn at least four credits in language arts and three credits in social studies. In addition to those requirements, 14 states required students to earn three credits each in science and mathematics, and an additional 12 states required students to earn at least two credits in those subjects (National Center for Education Statistics, 2001). This policy change is reflected in students' course-taking patterns. In 1998, 76% of American high school graduates had earned at least four credits in language arts, three in social studies, and two each in science and mathematics. This is a dramatic increase in the proportion of students in the general population earning this number and combination of academic credits; in 1982, only 32% of high school graduates had done so (National Center for Education Statistics, 2001).

In addition to these kinds of policy changes, which potentially affect all students, transition planning requirements, introduced in the 1990 amendments to IDEA and expanded in IDEA '97, could be expected to have an impact on the course taking of students with disabilities. As mentioned in Chapter 1, IDEA '97 requires that the course of study that is appropriate to help students achieve their transition goals be specified in their individualized education program (IEP) from age 14 onward (although the courses and services identified do not need to begin until age 16). Some of the differences between courses taken by secondary school students with disabilities in the mid-1980s and those taken in 2001 may result from implementation of these transition planning requirements.

Understanding the data collection instruments used in NLTS and NLTS2 is important for accurately interpreting the comparisons reported in this chapter. As noted earlier, in NLTS, school staff who were knowledgeable about the overall school programs of students with disabilities were asked to record on a "school record abstract" form each course students had taken in their most recent school year. The specific courses identified (e.g., algebra 2, biology) were coded into the broad categories reported in Exhibits 3-1 and 3-2 (e.g., mathematics, science). In NLTS2, school staff reported the courses students with disabilities were taking in the spring semester of 2002 in those broad categories, rather than reporting specific courses.[2] Therefore, NLTS students had a full school year in which to take a given kind of course, whereas NLTS2 students had a single-semester opportunity to do so. This difference could result in overstating the enrollment of cohort 1 students in a given kind of course relative to cohort 2 students, thereby underestimating increases over time and overestimating decreases over time. This difference is unlikely to have a marked impact on estimates for courses that typically are a full school year in duration, as are many academic subjects, but could result in higher course-taking rates in cohort 1 than cohort 2 for subjects that often are single-semester courses, such as nonacademic electives.

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[1] Credits are measured in Carnegie units. The original source of the unit, the Carnegie Foundation, describes the unit, developed in 1906, as "a measure of the amount of time a student has studied a subject. For example, a total of 120 hours in one subject—meeting 4 or 5 times a week for 40 to 60 minutes, for 36 to 40 weeks each year—earns the student one 'unit' of high school credit. Fourteen units were deemed to constitute the minimum amount of preparation that may be interpreted as 'four years of academic or high school preparation'" (Carnegie Foundation, n.d., p. 1).

[2] NLTS2 also is collecting students' high school transcripts, which will enable a more fine-grained analysis of course taking when students have completed their full high school careers.

Academic Course Taking

The vast majority of both cohort 1 and cohort 2 students with disabilities were taking at least one academic course as part of their school programs in the period for which data were collected, usually language arts (Exhibit 3-1), with no change in language arts enrollment over time.

Exhibit 3-1
CHANGES IN ACADEMIC COURSE TAKING BY STUDENTS WITH DISABILITIES

	Cohort 1 (1985-86 or 1986-87)	Cohort 2 (2001-02)	Percentage-Point Change
Percentage taking:			
Any academic course	97.4 (.6)	98.1 (.6)	+.7
Language arts	95.2 (.8)	95.2 (.9)	.0
Mathematics	81.9 (1.4)	92.5 (1.1)	**+10.6*** **
Science	62.3 (1.8)	83.1 (1.5)	**+20.8*** **
Social studies	74.6 (1.6)	88.0 (1.3)	**+13.4*** **
Foreign language	5.8 (.9)	21.1 (1.7)	**+15.3*** **

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant in a two-tailed test at the following level: ***=p<.001.

However, all other kinds of academic courses were much more likely to be taken by cohort 2 students than their cohort 1 peers. Mathematics course taking shows an 11-percentage-point increase, with 92% of cohort 2 students taking math (p<.001). An even larger increase, 21 percentage points, is noted for science course taking. Whereas 62% of cohort 1 students with disabilities were taking science, more than 8 in 10 cohort 2 students were doing so (p<.001). Almost 90% of cohort 2 students were taking social studies, a 13-percentage-point increase over cohort 1 (p<.001). Foreign language course taking increased by a similar amount (15 percentage points, p<.001), although it was a part of the school programs of only about one-fifth of cohort 2 students with disabilities.

Nonacademic Course Taking

Nonacademic[3] course taking also increased over time (Exhibit 3-2). Almost 90% of cohort 2 students with disabilities were taking at least one nonacademic course in the spring semester of 2001, a 5-percentage-point increase over cohort 1 (p<.01). However, this overall increase masks a less consistent picture across types of nonacademic classes. A 16-percentage-point increase is noted in the proportion of cohort 2 students taking fine arts or performing arts courses (p<.001), so that about half of cohort 2 students were taking them. In contrast, vocational education course taking declined by 7 percentage points (p<.01). About two-thirds of cohort 1 students were taking a vocational education course, compared with 61% of cohort 2 students. However, it is important to restate that the differences mentioned earlier in the ways courses were recorded for NLTS and NLTS2 students may result in higher estimates of course taking in cohort 1 than in cohort 2, thereby potentially understating increases over time and overstating decreases.

[3] Nonacademic courses include the courses indicated in Exhibit 3-2.

Exhibit 3-2
CHANGES IN NONACADEMIC COURSE TAKING BY STUDENTS WITH DISABILITIES

	Cohort 1 (1985-86 or 1986-87)	Cohort 2 (2001-02)	Percentage-Point Change
Percentage taking:			
Any nonacademic course	83.6	88.9	**+5.3****
	(1.4)	(1.3)	
Vocational education	68.4	61.0	**-7.4****
	(1.7)	(2.0)	
Fine arts/performing arts	32.7	48.7	**+16.0*****
	(1.7)	(2.0)	
Physical education	70.1	71.7	+1.6
	(1.7)	(1.8)	
Life skills/study skills	26.9	35.5	**+8.6*****
	(1.6)	(1.9)	

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Vocational education includes both prevocational and occupationally specific vocational education. Life skills includes instruction in life skills, social skills, and/or study skills.

Standard errors are in parentheses.

Statistically significant in a two-tailed test at the following levels: **=p<.01, ***=p<.001.

Instructional Settings

As mentioned in Chapter 2, the movement that began in the 1980s to include students with disabilities in general education settings, where appropriate, is reflected in a shift away from having students with disabilities attend special schools that serve only that population and toward their attendance at regular secondary schools. This shift, along with the large increases noted above in students with disabilities taking such courses as science and foreign language, suggests that students' participation in special education courses would decline and their participation in general education courses would increase. Increased participation in general education classes by students with disabilities is an important component of providing them access to the general education curriculum. However, their general education participation, without supports for the teachers and students involved, could present unintended challenges to students' ability to succeed at school.

This section addresses changes in students' participation in general and special education classes for the variety of subjects they take. It also considers the response of schools to the participation of students with disabilities in general education classes, as reflected in their policies of providing supports to general education teachers who have students with disabilities in their classes.

Changes in Instructional Settings

A dramatic change in instructional settings is indicated in the 21-percentage-point decline in students with disabilities taking any course at all in special education classes (Exhibit 3-3). In spring 2001, 30% of students with disabilities were taking no special education courses, a fairly rare occurrence in cohort 1 (9%, p<.001). However, there was not a corresponding increase in students with disabilities taking at least one general education class, in part because most cohort 1 students (84%) already were taking such a class. A small but statistically significant increase in receiving instruction at a vocational center also is noted (2% vs. 7% in cohorts 1 and 2, p<.001).

Exhibit 3-3
CHANGES IN INSTRUCTIONAL SETTINGS OF STUDENTS WITH DISABILITIES

	Cohort 1 (1985-86 or 1986-87)	Cohort 2 (2001-02)	Percentage-Point Change
Percentage receiving any instruction in:			
General education classes	84.0	87.6	+3.6
	(1.3)	(1.3)	
Special education classes	90.6	69.8	**-20.8*****
	(1.0)	(1.9)	
Individualized settings	1.1	1.9	+.8
	(.4)	(.6)	
A vocational education center	2.5	6.7	**+4.2*****
	(.6)	(1.0)	

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant in a two-tailed test at the following level: ***=p<.001.

This pattern of change in settings can be understood, in part, by examining the changes over time in settings for academic and nonacademic course taking (Exhibit 3-4). Cohort 2 students' participation in general education courses was more likely to involve academic courses than was true for their cohort 1 peers. There was a 9-percentage-point increase over time in students with disabilities taking at least one academic general education course, corresponding to an 11-percentage-point decline in special education academic course taking ($p<.001$ for both changes). Increases of 8 to 10 percentage points are noted in students taking mathematics, science, and social studies in general education classes ($p<.01$ and $p<.001$). Decreases of similar sizes in taking such courses in special education classes also are apparent (6 to 9 percentage

Exhibit 3-4
CHANGES IN INSTRUCTIONAL SETTINGS OF STUDENTS WITH DISABILITIES, BY TYPE OF COURSE

	Percentage Taking Course Who Were Taking It in:					
	A General Education Class			A Special Education Class		
Type of Course Taken	Cohort 1 (1985-86 or 1986-87)	Cohort 2 (2001-02)	Percentage-Point Change	Cohort 1 (1985-86 or 1986-87)	Cohort 2 (2001-02)	Percentage-Point Change
Any academic course	61.5	70.2	**+8.7*****	70.1	59.1	**-11.0*****
	(1.8)	(1.9)		(1.7)	(2.0)	
Language arts	43.4	48.9	+5.5	63.8	54.4	**-9.4*****
	(1.9)	(2.1)		(1.8)	(2.1)	
Mathematics	44.7	52.7	**+8.0****	56.8	50.6	**-6.2***
	(2.0)	(2.1)		(2.0)	(2.1)	
Science	57.5	66.1	**+8.6****	43.7	37.1	**-6.6***
	(2.4)	(2.2)		(2.4)	(2.2)	
Social studies	53.7	63.9	**+10.2*****	47.9	38.9	**-9.0****
	(2.2)	(2.1)		(2.2)	(2.2)	
Any nonacademic course	93.8	83.8	**-10.0*****	19.4	46.1	**+26.7*****
	(1.0)	(1.6)		(1.6)	(2.1)	
Vocational education	75.8	70.6	-5.2	28.2	34.8	**+6.6***
	(1.9)	(2.3)		(2.0)	(2.4)	
Fine arts/performing arts	83.4	87.0	+3.6	17.0	12.4	-4.6
	(2.5)	(1.9)		(2.5)	(1.9)	
Life skills/study skills	64.9	35.7	**-29.2*****	35.8	60.6	**+24.8*****
	(3.2)	(3.0)		(3.2)	(3.1)	

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only factors for which there was a significant change for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

points, p<.05 and p<.01), along with a 9-percentage-point decrease in the proportion of students taking language arts in a special education class (p<.001). The instructional setting for foreign language did not change markedly over time; it was predominantly a general education course at both times.

In contrast to this pattern for academic course taking, it became increasingly likely over time that nonacademic courses were taken in special education classes, particularly life skills or study skills courses. Whereas almost all cohort 1 students with disabilities who were taking a nonacademic course (94%) were taking at least one in a general education class, 84% of cohort 2 students who were taking such a class were doing so in that setting (p<.001). At the same time, there was a 27-percentage-point increase in students with disabilities taking nonacademic courses in special education classes (p<.001), due to a 25-percentage-point increase in the likelihood that life skills or study skills courses were being taken in special education classes. Vocational education also was more likely to be a special education class for cohort 2 than for cohort 1 students (35% vs. 28%, p<.05). There was no change in settings for physical education courses.

Supports Provided to General Education Teachers with Students with Disabilities in Their Classes

The increasing likelihood that students with disabilities were taking academic courses in general education classes raises a question regarding the extent to which the instructional contexts, practices, and supports that characterize those classes were enabling students with disabilities in them to succeed. NLTS2 has described the general education academic classes frequented by students with disabilities at some length (Wagner, Newman, et al, 2003), using data collected through the NLTS2 general education teacher survey for the 2001-02 school year. NLTS did not collect similar information on the characteristics of general education classrooms in which students with disabilities were receiving instruction in the mid-1980s, so comparisons between cohort 1 and 2 students on their experiences in those classrooms are not possible. However, the two studies both have addressed the policies of students' schools regarding providing supports to general education teachers who had students with disabilities in their classes. Specifically, NLTS and NLTS2 have investigated the extent to which general education teachers were reported in the school background and school characteristics surveys to receive five types of support in schools that had general education/inclusion placement options for students with disabilities: consultation by special education or other staff; special materials or equipment to use with students with disabilities; inservice training regarding the needs of students with disabilities; teacher aides, instructional assistants, or aides for individual students; and smaller student loads or class sizes.

Virtually all students with disabilities were going to schools where there was a policy of providing at least one of these supports to general education teachers who had students with disabilities in their classes. Consultation by special education or other staff was the most common type of support; 97% of students in both cohorts were attending schools with a policy to make this type of support available (Exhibit 3-5). Other forms of support were less common in cohort 1, but there were large increases in their prevalence over time. The largest increase was

Exhibit 3-5
CHANGES IN SUPPORTS PROVIDED TO GENERAL EDUCATION TEACHERS WITH STUDENTS WITH DISABILITIES IN THEIR CLASSES

	Cohort 1 (1985-86/ 1986-87)	Cohort 2 (2000-01)	Percentage-Point Change
Percentage in schools with the following supports for general education teachers with students with disabilities in their classes:			
Consultation from a special educator	96.6 (.7)	96.8 (.7)	+.2
Special materials/equipment to use with students with disabilities	51.8 (1.9)	79.2 (1.7)	**+27.4*** **
Inservice training related to students with disabilities	43.7 (1.9)	71.2 (1.9)	**+27.5*** **
Classroom aide for teacher or individual student	28.0 (1.7)	84.4 (1.5)	**+56.4*** **
Smaller class size	9.7 (1.1)	31.8 (2.0)	**+22.1*** **

Sources: NLTS Wave 1 school background survey and NLTS2 Wave 1 school characteristics survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following level: ***=p<.001.

in the policy of providing an instructional assistant to a teacher or an individual aide to a student with disabilities.[4] Only about one-fourth of cohort 1 students were going to schools with this policy; in cohort 2, 84% of students were doing so (p<.001). Policies to provide special materials or equipment to use for students with disabilities were reported in schools attended by 79% of cohort 2 students, and policies to provide teachers with inservice training related to students with disabilities were reported in schools attended by 71% of these students. These are increases of 27 and 28 percentage points, respectively (p<.001). A reduced class size was offered to general education teachers with students with disabilities in schools attended by almost one-third of cohort 2 students, compared with 10% of cohort 1 students (p<.001).

Related Services

Youth with disabilities may require a variety of support services to function in their daily life and perform in school. Some services are arranged for by families and provided by a variety of community-based organizations. In addition, students with disabilities who qualify for special education may receive related services to help them benefit from special education, as prescribed in a student's IEP. The related-services provisions of IDEA make schools a major provider of health-related, adaptive, social, emotional, and technology supports for students with disabilities.

[4] Some of the large increase in the reported provision of teacher or student aides may result from the expanded wording of this question used in NLTS2. NLTS asked school staff to report whether general education teachers were offered "human aides" when they had students with disabilities in their classes, which may have been interpreted to refer to aides for particular students with disabilities. NLTS2 expanded this response category, asking whether teachers were provided "teacher aides, instructional assistants, or aides for individual students," which may have been interpreted to include both aides for the classroom and aides assigned to individual students with disabilities.

Exhibit 3-6
CHANGES IN SERVICES PROVIDED TO STUDENTS WITH DISABILITIES

	Cohort 1 (1985-86 or 1986-87)	Cohort 2 (2001-02)	Percentage-Point Change
Percentage with IEP that specified receipt of:			
Speech/language pathology services	17.4 (1.4)	13.7 (1.5)	-3.7
Mental health services	12.8 (1.2)	19.6 (1.8)	**+6.8****
Special transportation	8.3 (1.0)	8.8 (1.2)	+.5
Social work services	8.0 (1.0)	12.1 (1.5)	**+4.1***
Adaptive physical education	6.3 (.9)	8.6 (1.2)	+2.3
Assistive devices/adaptations	2.9 (.6)	8.0 (1.2)	**+5.1*****
Occupational therapy	3.0 (.6)	3.6 (.8)	+.4
Health services	3.1 (.6)	6.3 (1.1)	**+3.2***
Physical therapy	2.0 (.5)	3.0 (.8)	+1.0
Audiology services	.8 (.3)	2.2 (.6)	+1.4
Orientation/mobility training	.1 (.1)	1.6 (.6)	**+1.5***

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Comparisons of findings from NLTS and NLTS2 permit an assessment of changes in the extent to which a variety of related services were provided to students with disabilities by or through their schools. Five of the 11 related services investigated in both studies (listed in Exhibit 3-6) show significant increases over time in the percentage of students with disabilities reported to receive them from or through their school. Mental health services show the largest increase—7 percentage points ($p<.01$)—with one in five cohort 2 students with disabilities receiving mental health services through their school. Increases of 3 to 5 percentage points are noted for the provision of assistive devices or adaptations and social work and health services ($p<.001$ and $p<.05$). Orientation/mobility training increased by 2 percentage points ($p<.05$). No significant increases are noted for speech/language pathology or audiology services, occupational or physical therapy, special transportation, or adaptive physical education.

Differential Changes in Students' School Programs across Disability Categories

In *The Individual and Household Characteristics of Youth with Disabilities*, an earlier report from NLTS2 (Wagner, Marder, Levine, et al., 2003), the diversity of secondary school students who receive special education services is documented. Not only do they have the wide range of demographic characteristics that are found in the general student population (e.g., differences in socioeconomic background, racial/ethnic and language diversity), but they also span the full spectrum of abilities on the many dimensions of functioning addressed in NLTS2 (e.g., mobility, communication, social skills). For example, although about 7 in 10 students with disabilities have no trouble carrying on a conversation, almost 1 in 10 are reported by parents to have "a lot of trouble" with such interactions. Similarly, most students with disabilities have normal use of their limbs, but 1 in 10 are reported to have "a lot of trouble" using their arms, hands, legs, or

feet. Parents rate about one-fourth of students with disabilities as having high social skills but about one-fifth as having poor social skills (Wagner, Marder, Levine, et al., 2003). Given this diversity, it is not surprising that changes in their secondary school programs occurred differentially across categories, as described below.[5]

Academic Course Taking

Despite the lack of significant change in the proportions of students with disabilities as a whole taking any academic course or language arts courses (presented in Exhibit 3-1), cohort 2 students with multiple disabilities were significantly more likely than their cohort 1 counterparts to be taking academic and language arts courses, by 12 and 14 percentage points, respectively ($p<.05$; Exhibit 3-7). Nonetheless, they still were less likely than students in other categories to take academic courses of every kind (e.g., 81% of cohort 2 students with multiple disabilities were taking mathematics, compared with 93% of students with other health impairments, $p<.001$).

Other academic course-taking increases were more widespread. Increases in taking science courses occurred across all disability categories, ranging from 13 to 34 percentage points ($p<.01$ and $p<.001$). Students in all categories except emotional disturbance show significant increases in mathematics course taking (8 to 17 percentage points, $p<.05$ to $p<.001$), and students in all categories except orthopedic impairment show significant increases in social studies course taking (10 to 29 percentage points, $p<.05$ to $p<.001$). Significant increases ranging from 8 to 22 percentage points occurred in foreign language course taking among students in all categories except other health impairment and multiple disabilities ($p<.01$ and $p<.001$ across categories).

With the exception of students with multiple disabilities, academic course taking in general, and language arts and mathematics course taking in particular, did not vary markedly across categories of cohort 2 students. However, cohort 2 students with mental retardation, like those with multiple disabilities, were less likely to take other kinds of academic courses than students in most other categories. For example, about three-fourths of cohort 2 students with mental retardation were taking science and social studies, compared with about 85% of students with hearing impairments ($p<.05$ and $p<.001$ for the two kinds of classes).

[5] Because there are too few students with deaf-blindness to report separately, they are combined with students with multiple disabilities for analyses reported in this section.

Exhibit 3-7
CHANGES IN ACADEMIC COURSE TAKING, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage taking:									
Any academic course									
Cohort 1 (1985-86/1986-87)	98.9	98.1	93.3	98.9	97.1	96.2	97.1	93.7	73.8
	(.6)	(1.1)	(1.5)	(.7)	(1.1)	(1.9)	(1.5)	(2.5)	(5.1)
Cohort 2 (2001-02)	99.1	99.2	94.8	98.4	99.6	95.8	93.9	97.1	85.8
	(.6)	(.6)	(1.4)	(1.0)	(.5)	(1.8)	(1.6)	(.9)	(2.5)
Percentage-point change	+.2	+1.1	+1.5	-.5	+2.5	-.4	-3.2	+3.4	**+12.0***
Language arts									
Cohort 1 (1985-86/1986-87)	97.2	96.5	88.9	97.5	95.4	91.1	94.4	92.6	70.1
	(.9)	(1.4)	(1.9)	(1.1)	(1.4)	(2.8)	(2.0)	(2.7)	(5.3)
Cohort 2 (2001-02)	95.4	97.8	93.5	96.1	99.0	94.5	91.2	96.4	84.4
	(1.3)	(1.0)	(1.6)	(1.5)	(.7)	(2.0)	(1.9)	(1.0)	(2.6)
Percentage-point change	-1.8	+1.3	+4.6	-1.4	+3.6	+3.4	-3.2	+3.8	**+14.3***
Mathematics									
Cohort 1 (1985-86/1986-87)	80.6	85.5	82.6	87.9	87.3	78.3	80.8	78.2	64.8
	(2.2)	(2.8)	(2.2)	(2.3)	(2.2)	(4.0)	(3.5)	(4.2)	(5.5)
Cohort 2 (2001-02)	92.7	94.7	92.3	93.0	95.7	90.9	88.9	92.9	81.4
	(1.6)	(1.5)	(1.7)	(2.0)	(1.5)	(2.6)	(2.1)	(1.4)	(2.8)
Percentage-point change	**+12.1*****	**+9.2****	**+9.7*****	+5.1	**+8.4****	**+12.6****	**+8.1***	**+14.7*****	**+16.6****
Science									
Cohort 1 (1985-86/1986-87)	64.1	72.9	52.0	71.1	65.2	61.8	52.1	59.4	32.2
	(2.7)	(3.5)	(3.0)	(3.2)	(3.1)	(4.7)	(4.4)	(5.0)	(5.4)
Cohort 2 (2001-02)	84.8	87.3	73.8	84.3	85.2	80.4	78.5	85.3	66.3
	(2.3)	(2.2)	(2.9)	(3.0)	(2.7)	(3.6)	(2.8)	(1.9)	(3.5)
Percentage-point change	**+20.7*****	**+14.4*****	**+21.8*****	**+13.2****	**+20.0*****	**+18.6****	**+26.4*****	**+25.9*****	**+34.1*****
Social studies									
Cohort 1 (1985-86/1986-87)	77.4	76.5	63.9	80.5	76.0	78.1	77.5	74.9	39.6
	(2.4)	(3.3)	(2.8)	(2.8)	(2.8)	(4.0)	(3.7)	(4.5)	(5.7)
Cohort 2 (2001-02)	90.2	90.4	74.7	93.2	87.9	88.2	82.7	88.3	69.0
	(1.9)	(1.9)	(2.9)	(2.0)	(2.5)	(2.9)	(2.6)	(1.8)	(3.4)
Percentage-point change	**+12.8*****	**+13.9*****	**+10.8****	**+12.7*****	**+11.9****	**+10.1***	+5.2	**+13.4****	**+29.4*****
Foreign language									
Cohort 1 (1985-86/1986-87)	6.8	13.5	1.0	4.3	6.2	18.2	12.4	13.6	.4
	(1.4)	(2.7)	(.6)	(1.4)	(1.6)	(3.8)	(2.9)	(3.5)	(.7)
Cohort 2 (2001-02)	24.3	31.0	8.7	15.1	26.7	33.6	24.4	18.8	8.8
	(2.7)	(3.0)	(1.8)	(2.8)	(3.3)	(4.2)	(2.9)	(2.1)	(2.0)
Percentage-point change	**+17.5*****	**+17.5*****	**+7.7*****	**+10.8*****	**+21.5*****	**15.4****	**+12.0****	+5.2	+8.4

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Nonacademic Course Taking

The significant increase in nonacademic course taking among students with disabilities as a whole (presented in Exhibit 3-3) occurred only among students with emotional disturbances or multiple disabilities (9 and 12 percentage points, respectively, $p<.05$; Exhibit 3-8). Students with multiple disabilities show increased enrollment in all forms of nonacademic courses, ranging

Exhibit 3-8
CHANGES IN NONACADEMIC COURSE TAKING, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage taking:									
Any nonacademic course									
Cohort 1 (1985-86/1986-87)	82.8	86.5	87.7	78.8	84.9	90.8	80.7	86.8	83.3
	(2.1)	(2.7)	(1.9)	(2.9)	(2.3)	(2.8)	(3.5)	(3.5)	(4.3)
Cohort 2 (2001-02)	88.5	87.6	92.2	87.6	89.9	88.4	86.6	88.0	95.1
	(2.0)	(2.1)	(1.7)	(2.6)	(2.3)	(2.8)	(2.3)	(1.8)	(1.6)
Percentage-point change	+5.7	+1.1	+4.5	**+8.8***	+5.0	-2.4	+5.9	+1.2	**+11.8***
Vocational education									
Cohort 1 (1985-86/1986-87)	69.8	60.9	69.2	63.5	71.7	63.9	54.8	66.7	62.8
	(2.6)	(3.8)	(2.7)	(3.4)	(2.9)	(4.7)	(4.4)	(4.8)	(5.6)
Cohort 2 (2001-02)	58.3	51.0	77.1	60.0	61.7	54.1	59.3	60.8	77.8
	(3.1)	(3.2)	(2.7)	(3.9)	(3.6)	(4.4)	(3.3)	(2.6)	(3.0)
Percentage-point change	**-11.5****	**-9.9***	**+7.9***	-3.5	**-10.0***	-9.8	+4.5	-5.9	**+15.0***
Fine/performing arts									
Cohort 1 (1985-86/1986-87)	33.4	43.4	28.1	31.9	28.0	52.7	33.0	39.5	36.6
	(2.7)	(3.9)	(2.7)	(3.3)	(2.9)	(4.9)	(4.2)	(5.0)	(5.6)
Cohort 2 (2001-02)	47.7	52.8	50.7	44.7	53.9	61.2	54.0	53.1	63.0
	(3.1)	(3.2)	(3.2)	(3.9)	(3.7)	(4.3)	(3.3)	(2.7)	(3.5)
Percentage-point change	**+14.3*****	+9.4	**+22.6*****	**+12.8***	**+25.9*****	+8.5	**+21.0*****	**+13.6***	**+26.4*****
Physical education									
Cohort 1 (1985-86/1986-87)	68.9	68.4	75.9	70.6	68.1	64.9	51.8	58.0	65.8
	(2.6)	(3.6)	(2.5)	(3.2)	(3.0)	(4.7)	(4.4)	(5.1)	(5.5)
Cohort 2 (2001-02)	70.4	72.4	77.5	71.6	75.7	67.8	63.6	71.4	83.2
	(2.8)	(2.9)	(2.7)	(3.6)	(3.2)	(4.1)	(3.2)	(2.5)	(2.7)
Percentage-point change	+1.5	+4.0	+1.6	+1.0	+7.6	+2.9	**+11.8***	**+13.4***	**+29.5****
Life skills/study skills									
Cohort 1 (1985-86/1986-87)	22.4	22.5	42.7	19.7	33.4	31.7	35.0	32.6	52.0
	(2.4)	(3.3)	(2.9)	(2.8)	(3.1)	(4.5)	(4.2)	(4.8)	(5.8)
Cohort 2 (2001-02)	26.2	22.4	72.6	45.6	26.9	42.7	40.0	32.2	75.0
	(2.7)	(2.7)	(2.9)	(4.0)	(3.3)	(4.4)	(3.3)	(2.5)	(3.1)
Percentage-point change	+3.8	-.1	**+29.9*****	**+25.9*****	-6.5	+11.0	+5.0	-.4	**+23.0*****

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

from a 15-percentage-point increase in taking vocational education (p<.05) to a 30-percentage-point increase in taking physical education (p<.01). Students with mental retardation also recorded a significant increase in vocational course taking (8 percentage points, p<.05), despite the overall decline in vocational education enrollment for students with disabilities as a whole.

Increases in nonacademic course taking were most widespread for fine arts courses, with seven of the disability categories having significant increases, which range from 13 percentage points for students with emotional disturbances (p<.05) to 26 percentage points for those with hearing impairments or multiple disabilities (p<.001). The categories of students whose fine arts course taking was the highest in cohort 1—students with speech or visual impairments—did not show a significant increase in cohort 2. Besides students with multiple disabilities, increases in

physical education course taking occurred only for students with orthopedic or other health impairments (12 and 13 percentage points, p<.05), and life skills or study skills course taking increased only for students with mental retardation or emotional disturbances (30 and 26 percentage points, p<.001).

Instructional Settings

The large decline in students with disabilities taking courses in special education settings that was noted previously for the group overall (presented in Exhibit 3-4) was fairly widespread (Exhibit 3-9), occurring for students in six of the disability categories and ranging from 12 to 26 percentage points (p<.05 and p<.001). No change is noted for students with other health impairments, who already were the least likely to be taking courses in special education settings in cohort 1. In contrast, the other two categories of students among whom there was no decrease in special education course taking were the most likely to be taking them in cohort 1; virtually all cohort 1 students with mental retardation or multiple disabilities were taking special education

Exhibit 3-9
CHANGES IN INSTRUCTIONAL SETTINGS, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage receiving any instruction in:									
General education classes									
Cohort 1 (1985-86/1986-87)	91.5 (1.5)	90.8 (2.2)	69.1 (2.6)	78.9 (2.8)	70.1 (2.9)	71.8 (4.2)	74.5 (3.6)	80.4 (4.0)	30.9 (5.2)
Cohort 2 (2001-02)	94.0 (1.5)	95.4 (1.4)	69.3 (3.0)	78.5 (3.3)	76.3 (3.2)	70.9 (4.0)	83.7 (2.5)	86.8 (1.8)	55.2 (3.6)
Percentage-point change	+2.5	+4.6	+.2	-.4	+6.2	-.9	+9.2	+6.4	**+24.3*** **
Special education classes									
Cohort 1 (1985-86/1986-87)	89.9 (1.7)	75.9 (3.2)	97.4 (.9)	89.1 (2.1)	94.1 (1.5)	78.6 (3.8)	79.8 (3.3)	66.2 (4.7)	98.1 (1.5)
Cohort 2 (2001-02)	65.8 (2.9)	50.1 (3.3)	91.6 (1.8)	74.0 (3.5)	67.6 (3.5)	54.2 (4.4)	68.0 (3.1)	65.6 (2.6)	95.0 (1.6)
Percentage-point change	**-24.1*** **	**-25.8*** **	-5.8	**-15.1*** **	**-26.5*** **	**-24.4*** **	**-11.8***	-.6	-3.1
An individualized setting									
Cohort 1 (1985-86/1986-87)	.5 (.4)	.4 (.5)	.9 (.5)	2.8 (1.1)	.4 (.4)	1.5 (1.1)	6.9 (2.1)	14.7 (3.5)	3.0 (1.9)
Cohort 2 (2001-02)	1.0 (.6)	1.1 (.7)	2.5 (1.0)	5.1 (1.7)	1.7 (1.0)	6.0 (2.1)	3.4 (1.2)	4.1 (1.1)	2.6 (1.2)
Percentage-point change	+.5	+.7	+1.6	+2.3	+1.3	+4.5	-3.5	**-10.6** **	-.4
A vocational education center									
Cohort 1 (1985-86/1986-87)	2.5 (.9)	1.3 (.9)	3.2 (1.0)	2.0 (1.0)	1.7 (.8)	1.5 (1.1)	1.6 (1.0)	.9 (.9)	7.0 (2.9)
Cohort 2 (2001-02)	6.0 (1.5)	2.2 (1.0)	11.8 (2.1)	5.3 (1.8)	2.3 (1.1)	6.9 (2.2)	6.5 (1.7)	6.3 (1.3)	17.8 (2.8)
Percentage-point change	+3.5	+.9	**+8.6*** **	+3.3	+.6	**+5.4***	**+4.9***	**+5.4*** **	**+10.8** **

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

courses, and their cohort 2 counterparts show no significant decline. However, students with multiple disabilities are the only ones showing a significant increase in taking general education courses, 24 percentage points ($p<.001$), with more than half of cohort 2 students with multiple disabilities taking at least one general education class. However, this rate is still significantly lower than that for students in any other category ($p<.01$ compared with students with mental retardation, the category with the next lowest rate of general education course taking).

Despite the absence of widespread increases in students' likelihood of taking any general education course, increases in providing several forms of support to general education teachers who had students with disabilities in their classes occurred across all disability categories. The data show increases of 16 to 34 percentage points across categories in students with disabilities attending schools with policies of providing disability-related inservice training, increases of 28 to 62 percentage points in their attending schools with policies of providing teachers or individual students with aides or assistants, and increases of 17 to 24 percentage points in their attending schools with policies of giving general education teachers smaller class sizes or student loads because they had students with disabilities in their classes. Significant increases also occurred for students in all categories except multiple disabilities in attending schools with policies of providing special materials or equipment to general education teachers to use with their students with disabilities, ranging from 14 to 32 percentage points. Differences in the size of changes across categories generally resulted in moderating the differences across categories that existed in cohort 1, so that cohort 2 students in various categories were more similar to each other than was true for cohort 1 students regarding their schools' policies toward general education teacher support.

Although students with disabilities as a whole show no significant change in receiving instruction in an individual setting, a significant decline in that kind of instruction is noted for students with other health impairments (11 percentage points, $p<.01$). Five categories of students show overall increases in course taking at a vocational center: 5 percentage points among students with visual, orthopedic, or other health impairments ($p<.05$ and $p<.001$), 9 percentage points for students with mental retardation ($p<.001$), and 11 percentage points for students with multiple disabilities ($p<.01$).

Instructional settings for academic courses. Changes in the settings in which students with disabilities were taking specific kinds of academic courses were limited to students in only a few disability categories (Exhibit 3-10). The increase in taking any general education academic classes and the corresponding decline in taking special education academic classes that occurred among students with disabilities as a whole (presented in Exhibit 3-5) resulted from changes in the settings for academic courses taken by students with learning disabilities or hearing impairments. They had 10- and 15-percentage-point increases in general education academic course taking ($p<.01$) and decreases of 12 and 16 percentage points in special education academic course taking ($p<.01$ and $p<.001$). In fact, students with hearing impairments had the most widespread pattern of change in settings for academic course taking, with increases in the likelihood of their language arts, science, and social studies courses being in general education settings (17 to 22 percentage points, $p<.01$ and $p<.001$) and corresponding declines in the likelihood of those courses being in special education classes (18 to 20 percentage points, $p<.001$). These changes are consistent with the sizable reduction in the proportion of students with hearing impairments attending special schools and the corresponding increase in their enrollment in regular secondary schools.

Exhibit 3-10
CHANGES IN INSTRUCTIONAL SETTINGS FOR ACADEMIC COURSES, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage taking course in setting:									
Any academic course									
General education class									
Cohort 1 (1985-86/1986-87)	71.0 (2.6)	82.2 (3.0)	28.9 (2.8)	61.4 (3.5)	51.4 (3.2)	70.8 (4.5)	62.5 (4.4)	73.0 (4.7)	18.0 (5.2)
Cohort 2 (2001-02)	79.6 (2.5)	83.1 (2.4)	32.1 (3.1)	58.7 (3.9)	66.3 (3.6)	66.6 (4.3)	70.6 (3.1)	73.2 (2.4)	27.5 (3.6)
Percentage-point change	**+9.6****	+.9	+3.2	+2.7	**+14.9****	-4.2	+8.1	+.2	+9.5
Special education class									
Cohort 1 (1985-86/1986-87)	65.3 (2.7)	35.9 (3.8)	93.7 (1.5)	70.5 (3.3)	72.1 (2.9)	41.9 (4.9)	59.1 (4.5)	45.3 (5.3)	93.2 (3.4)
Cohort 2 (2001-02)	53.4 (3.1)	40.4 (3.2)	90.8 (1.9)	63.2 (3.8)	55.9 (3.7)	42.3 (4.5)	52.8 (3.4)	53.5 (2.7)	91.9 (2.2)
Percentage-point change	**-11.9****	+4.5	-2.9	-7.3	**-16.2*****	+.4	-6.3	+8.2	-1.3
Language arts									
General education class									
Cohort 1 (1985-86/1986-87)	48.4 (2.9)	72.6 (3.6)	17.6 (2.4)	49.0 (3.6)	35.2 (3.1)	67.2 (4.7)	54.0 (4.6)	62.0 (5.2)	7.1 (3.5)
Cohort 2 (2001-02)	55.1 (3.2)	69.7 (3.1)	16.4 (2.5)	42.6 (4.0)	52.6 (3.8)	62.7 (4.5)	53.7 (3.5)	56.8 (2.8)	16.9 (3.0)
Percentage-point change	+6.7	-2.9	-1.2	-6.4	**+17.4*****	+.5	-.3	-5.2	**+9.8***
Special education class									
Cohort 1 (1985-86/1986-87)	58.7 (2.8)	32.2 (3.7)	89.8 (1.9)	61.4 (3.5)	69.1 (3.0)	35.4 (4.8)	50.7 (4.6)	41.6 (5.3)	94.7 (3.1)
Cohort 2 (2001-02)	49.2 (3.2)	35.4 (3.2)	86.6 (2.3)	55.7 (4.0)	50.5 (3.8)	35.7 (4.5)	48.3 (3.5)	46.4 (2.8)	83.6 (3.0)
Percentage-point change	-9.5*	+3.2	-3.2	-5.7	**-18.6*****	+.3	-2.4	+4.8	**-11.1***
Mathematics									
General education class									
Cohort 1 (1985-86/1986-87)	53.0 (3.2)	73.8 (3.8)	15.8 (2.4)	41.9 (3.7)	47.7 (3.4)	62.9 (5.0)	48.5 (5.0)	61.3 (5.6)	13.6 (5.1)
Cohort 2 (2001-02)	61.9 (3.2)	70.1 (3.1)	14.8 (2.4)	43.3 (4.1)	52.4 (3.9)	59.3 (4.7)	53.4 (3.5)	55.2 (2.8)	9.7 (2.5)
Percentage-point change	**+8.9***	-3.7	-1.0	+1.4	+4.7	-3.6	+4.9	-6.1	3.9

Exhibit 3-10
CHANGES IN INSTRUCTIONAL SETTINGS FOR ACADEMIC COURSES, BY DISABILITY CATEGORY (Concluded)

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage taking course in setting:									
Science									
General education class									
Cohort 1 (1985-86/1986-87)	66.5 (3.4)	83.4 (3.4)	24.4 (3.5)	49.3 (4.2)	41.9 (3.9)	62.2 (5.7)	61.2 (5.3)	79.9 (5.3)	28.3 (8.1)
Cohort 2 (2001-02)	74.4 (3.0)	80.0 (2.8)	30.1 (3.5)	52.0 (4.4)	63.9 (4.0)	67.0 (4.6)	68.7 (3.4)	71.9 (2.7)	25.6 (4.1)
Percentage-point change	+7.9	-3.4	+5.7	+2.7	**+22.0*** **	+4.8	+7.5	-8.0	+2.7
Special education class									
Cohort 1 (1985-86/1986-87)	35.0 (3.4)	17.8 (3.5)	76.1 (3.5)	51.6 (4.2)	58.4 (3.9)	37.8 (5.7)	38.9 (5.3)	23.2 (5.5)	71.7 (8.1)
Cohort 2 (2001-02)	29.2 (3.1)	23.1 (3.0)	73.6 (3.4)	49.0 (4.4)	38.0 (4.0)	33.3 (4.6)	30.7 (3.4)	31.6 (2.8)	77.2 (3.9)
Percentage-point change	-5.8	+5.3	-2.5	-2.6	**-20.4*** **	-4.5	-8.2	+8.4	+5.5
Social studies									
General education class									
Cohort 1 (1985-86/1986-87)	61.8 (3.1)	79.3 (3.7)	22.8 (3.1)	48.0 (3.9)	41.6 (3.6)	74.4 (4.7)	58.2 (5.1)	68.4 (5.7)	20.0 (6.9)
Cohort 2 (2001-02)	71.4 (3.0)	79.2 (2.8)	29.0 (3.5)	51.5 (4.2)	58.9 (4.0)	66.8 (4.6)	69.2 (3.4)	69.5 (2.7)	20.7 (3.8)
Percentage-point change	**+9.6***	-.1	+6.2	+3.5	**+17.3****	-7.6	+11.0	+1.1	+.7
Special education class									
Cohort 1 (1985-86/1986-87)	40.1 (3.2)	20.7 (3.7)	78.2 (3.1)	53.6 (3.9)	60.6 (3.5)	26.3 (4.8)	43.8 (5.2)	31.8 (5.7)	80.3 (6.9)
Cohort 2 (2001-02)	32.2 (3.1)	24.0 (3.0)	73.7 (3.4)	48.0 (4.2)	42.3 (4.0)	33.6 (4.6)	32.9 (3.5)	33.1 (2.8)	82.2 (3.6)
Percentage-point change	-7.9	+3.3	-4.5	-5.6	**-18.3*** **	+7.3	**-10.9***	+1.3	+1.9

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only factors for which there was a significant change for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Students with multiple disabilities show a 10-percentage-point increase in general education language arts course taking ($p<.05$) and a corresponding 11-percentage-point decline in taking those courses in special education classes, $p<.05$). Students with learning disabilities show significant increases in taking both mathematics and social studies in general education classes (9 and 10 percentage points, $p<.05$) but no corresponding decline in taking those courses in special education classes.

These changes did little to alter the wide variation across disability categories in the settings in which students were taking particular kinds of courses. For example, there was a 64-percentage-point difference in cohort 1 between the categories of students most and least likely to be taking any academic class in a general education setting; the spread between categories was 56 percentage points for cohort 2 students. Those with speech impairments were

the most likely to be taking general education academic courses in both cohorts (82% and 83%), and students with multiple disabilities were the least likely to be doing so (18% and 28%).

Instructional settings for nonacademic courses. Changes in the settings in which students with disabilities were taking specific kinds of nonacademic courses were more widespread than those for academic courses (Exhibit 3-11). Increases in taking any nonacademic class in a special education settings occurred among students in seven disability categories, ranging from 10 to 39 percentage points ($p<.05$ and $p<.001$). The two categories of students who show no increase in special education nonacademic course taking—those with orthopedic impairments or multiple disabilities—were the most likely already to be taking such courses in cohort 1. Students with multiple disabilities continued to be the most likely to take nonacademic special education courses in cohort 2 (84%), but students with mental retardation surpassed those with orthopedic impairments in becoming the second most likely category of students to take nonacademic special education classes (75%).

Exhibit 3-11
CHANGES IN INSTRUCTIONAL SETTINGS FOR NONACADEMIC COURSES, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage taking course in setting:									
Any nonacademic course									
General education class									
Cohort 1 (1985-86/1986-87)	97.2 (1.0)	95.7 (1.7)	91.9 (1.7)	83.1 (2.9)	84.6 (2.5)	84.5 (3.8)	73.7 (4.2)	90.4 (3.3)	75.4 (5.4)
Cohort 2 (2001-02)	90.6 (1.9)	90.7 (2.0)	65.9 (3.2)	73.6 (3.7)	71.4 (3.6)	65.2 (4.5)	72.8 (3.2)	83.1 (2.1)	51.3 (3.7)
Percentage-point change	**-6.6****	-5.0	**-26.0*****	**-9.5***	**-13.2****	**-19.3*****	-.9	-7.3	**-24.1*****
Special education class									
Cohort 1 (1985-86/1986-87)	10.1 (1.9)	10.3 (2.6)	35.9 (3.1)	28.0 (3.5)	39.6 (3.4)	34.9 (5.0)	59.3 (4.7)	32.4 (5.2)	84.0 (4.6)
Cohort 2 (2001-02)	38.0 (3.2)	32.2 (3.2)	75.0 (2.9)	54.8 (4.2)	50.1 (4.0)	49.9 (4.7)	57.9 (3.6)	44.6 (2.8)	84.1 (2.7)
Percentage-point change	**+27.9*****	**+21.9*****	**+39.1*****	**+26.8*****	**+10.5***	**+15.0***	-1.4	**+12.2***	+.1
Vocational education									
Special education class									
Cohort 1 (1985-86/1986-87)	18.8 (2.6)	17.7 (3.8)	51.6 (3.6)	31.8 (4.2)	48.7 (3.7)	38.1 (6.3)	49.0 (5.5)	28.9 (5.8)	78.1 (5.9)
Cohort 2 (2001-02)	24.2 (3.5)	24.0 (3.8)	65.4 (3.5)	38.6 (5.1)	44.7 (4.7)	56.3 (5.5)	41.4 (4.5)	37.9 (3.4)	75.3 (3.6)
Percentage-point change	+5.4	+6.3	**+13.8****	+6.8	-4.0	**+18.2***	-7.6	+9.0	-2.8

Exhibit 3-11
CHANGES IN INSTRUCTIONAL SETTINGS FOR NONACADEMIC COURSES, BY DISABILITY CATEGORY (Concluded)

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage taking course in setting:									
Fine arts/performing arts									
General education class									
Cohort 1 (1985-86/1986-87)	89.2 (3.1)	93.4 (3.1)	71.5 (5.1)	75.0 (5.3)	70.2 (6.0)	65.1 (6.2)	71.6 (8.0)	74.6 (7.4)	26.7 (8.9)
Cohort 2 (2001-02)	93.3 (2.2)	93.5 (2.2)	72.2 (4.1)	76.0 (5.1)	78.2 (4.4)	65.2 (5.4)	86.9 (3.2)	88.4 (2.4)	51.0 (4.6)
Percentage-point change	+4.1	+.1	+.7	-1.0	+8.0	+.1	+15.3	+13.8	**+24.3***
Special education class									
Cohort 1 (1985-86/1986-87)	11.3 (3.2)	6.8 (3.1)	28.5 (5.1)	25.0 (5.3)	30.3 (6.0)	34.9 (6.2)	30.1 (8.1)	25.4 (7.4)	73.3 (8.9)
Cohort 2 (2001-02)	6.1 (2.1)	5.8 (2.1)	28.7 (4.2)	20.9 (4.9)	22.4 (4.4)	35.1 (5.5)	12.7 (3.1)	11.0 (2.3)	50.0 (4.6)
Percentage-point change	-5.2	+1.0	+.2	-4.1	-7.9	+.2	**-17.4***	-14.4	**-23.3***
Physical education									
General education class									
Cohort 1 (1985-86/1986-87)	93.0 (1.8)	90.7 (2.8)	71.7 (3.1)	74.9 (3.6)	69.0 (3.7)	58.3 (6.5)	31.6 (5.8)	73.7 (5.8)	24.8 (5.8)
Cohort 2 (2001-02)	95.9 (1.5)	94.0 (1.8)	68.0 (3.4)	80.3 (3.7)	75.1 (3.8)	59.8 (5.4)	61.7 (4.2)	84.8 (2.3)	49.8 (4.0)
Percentage-point change	+2.9	+3.3	-3.7	+5.4	+6.1	+1.5	**+30.1*****	+11.1	**+25.0*****
Special education class									
Cohort 1 (1985-86/1986-87)	7.0 (1.8)	9.3 (2.8)	28.3 (3.1)	25.1 (3.6)	31.0 (3.7)	41.3 (6.4)	68.4 (5.8)	26.3 (5.8)	75.2 (5.8)
Cohort 2 (2001-02)	3.9 (1.4)	6.4 (1.8)	34.9 (3.5)	19.2 (3.7)	24.9 (3.8)	40.1 (5.4)	41.4 (4.2)	14.5 (2.3)	52.1 (4.0)
Percentage-point change	-3.1	-2.9	+6.6	-5.9	-6.1	-1.2	**-27.0*****	-11.8	**-23.1****
Life skills/study skills									
General education class									
Cohort 1 (1985-86/1986-87)	77.9 (4.9)	80.5 (6.6)	49.7 (4.6)	58.3 (7.5)	46.2 (6.5)	51.7 (9.3)	59.3 (7.7)	61.7 (9.3)	6.3 (4.0)
Cohort 2 (2001-02)	50.5 (6.2)	57.8 (6.5)	17.7 (2.9)	24.9 (5.3)	33.2 (6.1)	24.3 (6.0)	31.7 (5.1)	34.0 (4.3)	12.1 (2.7)
Percentage-point change	**-27.4*****	**-22.7***	**-32.0*****	**-33.4*****	-13.0	**-27.4***	**-27.6****	**-27.7****	+4.8
Special education class									
Cohort 1 (1985-86/1986-87)	22.1 (4.9)	21.0 (6.7)	52.2 (4.6)	41.7 (7.5)	54.0 (6.5)	51.0 (9.3)	42.7 (7.8)	39.5 (9.4)	93.7 (4.0)
Cohort 2 (2001-02)	42.3 (6.1)	41.8 (6.5)	82.5 (2.9)	73.1 (5.4)	68.8 (6.0)	66.9 (6.6)	66.1 (5.2)	62.9 (4.4)	89.3 (2.6)
Percentage-point change	**+20.2***	**+20.8***	**+33.3*****	**+31.4*****	+14.8	+15.9	**+23.4***	**+23.4***	-4.4

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only factors for which a significant change occurred for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

As with the full population of students with disabilities, the change in settings for nonacademic courses as a whole occurred largely from changes in settings for life skills or study skills courses. Most categories of students with disabilities registered increases in taking such courses in special education classes (ranging from 20 to 33 percentage points, $p<.05$ and $p<.001$) and corresponding decreases in taking such classes in general education settings (23 to 33 percentage points, $p<.05$ to $p<.001$). Again, students with multiple disabilities show no move toward greater life skills course taking in special education settings because virtually all of them already were doing so in cohort 1 (94%).

The increase in vocational education course taking in special education classes that was noted previously for students with disabilities overall occurred primarily from large increases among students with mental retardation or visual impairments (14 and 18 percentage points, $p<.01$ and $p<.05$). Although neither fine arts nor physical education show significant changes in settings overall, students with multiple disabilities in cohort 2 were more likely to be taking such courses in general education classes, registering increases of 24 and 25 percentage points ($p<.05$ and $p<.001$). A similar shift in the setting for physical education is noted for students with orthopedic impairments (30 percentage points, $p<.001$), who also show a decline in the prevalence of taking fine arts courses in special education classes (17 percentage points, $p<.05$).

Related Services

Although significant increases in the provision of related services to students with disabilities were noted previously for only 5 of the 11 services investigated in NLTS and NLTS2 (presented in Exhibit 3-6), all 11 services were provided significantly more often to students in at least one disability category (Exhibit 3-12). Some services increased for the categories of students for whom they seem most directly applicable. For example, the largest increase in mental health services is noted for students with emotional disturbances (14 percentage points, $p<.01$), but increases also occurred for those with speech impairments and mental retardation (11 and 7 percentage points, $p<.001$ and $p<.05$). Similarly, audiology services increased primarily for students with hearing impairments (24 percentage points, $p<.001$) and for those with multiple disabilities, including deaf-blindness (7 percentage points, $p<.05$), but students with visual impairments also were more likely to receive audiology services in cohort 2 than previously (9 percentage points, $p<.01$). Orientation and mobility training increased the most among those with visual or orthopedic impairments (43 and 23 percentage points, $p<.001$) or with multiple disabilities, including deaf-blindness (16 percentage points, $p<.001$).

Exhibit 3-12
CHANGES IN RELATED SERVICES PROVIDED, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage with IEP that specified receipt of:									
Speech/language pathology services									
Cohort 1 (1985-86/1986-87)	10.9 (1.8)	54.9 (3.9)	28.6 (2.6)	7.5 (1.8)	55.9 (3.2)	7.5 (2.5)	21.7 (3.5)	16.3 (3.8)	60.0 (5.5)
Cohort 2 (2001-02)	5.4 (1.5)	64.3 (3.7)	31.1 (3.1)	7.2 (2.3)	56.7 (4.1)	19.9 (3.9)	27.6 (3.3)	18.6 (2.2)	58.6 (3.7)
Percentage-point change	-5.5	+9.4	+2.5	-.3	+.8	**+12.4****	+5.9	+2.3	-1.4
Mental health services									
Cohort 1 (1985-86/1986-87)	11.0 (1.8)	4.3 (1.6)	8.3 (1.6)	34.5 (3.3)	15.5 (2.3)	9.5 (2.8)	8.8 (2.4)	14.7 (3.7)	19.1 (4.4)
Cohort 2 (2001-02)	15.2 (2.5)	15.7 (2.9)	15.4 (2.5)	48.9 (4.3)	18.9 (3.2)	17.4 (3.8)	12.0 (2.5)	17.5 (2.3)	22.5 (3.3)
Percentage-point change	+4.2	**+11.4*****	**+7.1***	**+14.4****	+3.4	+7.9	+3.2	+2.8	+3.4
Special transportation assistance									
Cohort 1 (1985-86/1986-87)	2.3 (.8)	3.2 (1.4)	19.2 (2.2)	9.1 (2.0)	16.0 (2.4)	29.0 (4.3)	55.2 (4.2)	15.8 (3.8)	53.7 (5.6)
Cohort 2 (2001-02)	1.4 (.8)	2.8 (1.3)	29.2 (3.1)	7.9 (2.4)	15.1 (2.9)	35.8 (4.8)	56.8 (3.6)	15.4 (2.1)	56.6 (3.7)
Percentage-point change	-.9	-.4	**+10.0****	-1.2	-.9	+6.8	+1.6	-.4	+2.9
Social work services									
Cohort 1 (1985-86/1986-87)	5.5 (1.3)	1.1 (.8)	10.0 (1.7)	19.2 (2.8)	7.1 (1.7)	7.9 (2.6)	9.2 (2.4)	9.2 (3.0)	17.1 (4.2)
Cohort 2 (2001-02)	7.6 (1.8)	7.1 (2.0)	15.9 (2.6)	30.5 (4.0)	11.6 (2.6)	18.7 (4.0)	10.4 (2.4)	11.6 (1.9)	26.6 (3.6)
Percentage-point change	+2.1	+6.0	+5.9	**+11.3***	+4.5	**+10.8***	+1.2	+2.4	+9.5
Adaptive physical education									
Cohort 1 (1985-86/1986-87)	1.7 (.7)	1.3 (.9)	15.3 (2.0)	5.7 (1.6)	3.1 (1.1)	16.1 (3.5)	45.7 (4.2)	24.8 (4.5)	41.8 (5.6)
Cohort 2 (2001-02)	1.8 (.9)	3.5 (1.5)	29.8 (3.1)	6.3 (2.1)	6.3 (2.0)	37.3 (4.6)	49.4 (3.6)	14.3 (2.0)	57.5 (3.7)
Percentage-point change	+.1	+2.2	**+14.5*****	+.6	+3.2	**+21.2*****	+3.7	**-10.5***	**+13.7***
Assistive devices/adaptations									
Cohort 1 (1985-86/1986-87)	.9 (.5)	1.8 (1.0)	3.4 (1.0)	.2 (.3)	37.2 (3.1)	47.8 (4.8)	31.1 (3.9)	6.5 (2.5)	25.7 (4.9)
Cohort 2 (2001-02)	4.6 (1.4)	4.9 (1.7)	14.4 (2.4)	2.9 (1.5)	41.8 (4.0)	73.0 (4.3)	40.2 (3.6)	10.8 (1.8)	39.1 (3.8)
Percentage-point change	+3.7	+3.1	**+11.0*****	+2.7	+4.6	**+25.2*****	+9.1	+4.3	**+13.4***
Occupational therapy									
Cohort 1 (1985-86/1986-87)	.8 (.5)	3.7 (1.5)	7.1 (1.5)	1.0 (.7)	.8 (.6)	3.1 (1.7)	30.4 (3.9)	5.4 (2.3)	33.0 (5.3)
Cohort 2 (2001-02)	.7 (.6)	1.9 (1.1)	8.8 (1.9)	1.2 (1.0)	5.0 (1.8)	17.9 (3.8)	38.3 (3.6)	6.7 (1.5)	40.9 (3.7)
Percentage-point change	-.1	-1.8	+1.7	+.2	**+4.2***	**+14.8*****	+7.9	+1.3	+7.9

Exhibit 3-12
CHANGES IN RELATED SERVICES PROVIDED, BY DISABILITY CATEGORY (Concluded)

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage with IEP that specified receipt of:									
Health services									
Cohort 1 (1985-86/1986-87)	2.4	0.3	5.4	1.6	5.3	6.0	10.3	5.2	4.8
	(.9)	(.4)	(1.3)	(.9)	(1.5)	(2.3)	(2.6)	(2.3)	(2.4)
Cohort 2 (2001-02)	4.0	2.1	10.8	8.6	11.8	17.9	19.3	8.7	24.0
	(1.3)	(1.2)	(2.1)	(2.5)	(2.7)	(3.8)	(3.0)	(1.7)	(3.4)
Percentage-point change	+1.6	+1.7	+5.4	**+7.0****	**+6.5***	**+11.9****	**+9.0***	+3.5	**+19.2*****
Physical therapy									
Cohort 1 (1985-86/1986-87)	.6	.8	3.7	.3	.6	5.9	41.9	4.9	28.4
	(.4)	(.7)	(1.1)	(.4)	(.5)	(2.2)	(4.1)	(2.2)	(5.1)
Cohort 2 (2001-02)	.8	.2	6.5	.4	4.2	16.1	46.8	3.1	36.5
	(.6)	(.4)	(1.7)	(.6)	(1.6)	(3.7)	(3.7)	(1.0)	(3.6)
Percentage-point change	+.2	-.6	+2.8	+.1	**+3.6***	**+10.2***	+4.9	-1.8	+8.1
Audiology									
Cohort 1 (1985-86/1986-87)	.0	.4	.4	.2	41.3	2.0	1.3	.1	3.7
		(.5)	(.4)	(.3)	(3.2)	(1.3)	(1.0)	(.3)	(2.1)
Cohort 2 (2001-02)	.7	3.2	1.9	1.1	65.7	11.1	2.0	1.2	10.6
	(.6)	(1.4)	(.9)	(.9)	(3.8)	(3.1)	(1.1)	(.6)	(2.4)
Percentage-point change	+.7	+2.8	+1.5	+.9	**+24.4*****	**+9.1****	+.7	+1.1	**+6.9***
Orientation/mobility training									
Cohort 1 (1985-86/1986-87)	.0	.0	.0	.0	.1	11.7	.0	.1	.9
					(.2)	(3.1)		(.3)	(1.1)
Cohort 2 (2001-02)	.2	.3	3.4	.4	2.0	55.0	23.0	1.3	17.2
	(.3)	(.4)	(1.2)	(.6)	(1.1)	(4.8)	(3.2)	(.7)	(2.9)
Percentage-point change	+.2	+.3	**+3.4****	+.4	+1.9	**+43.3*****	**+23.0*****	+1.2	**+16.3*****

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

However, for other services, the categories of students for whom they might seem most directly applicable are not those that showed significant increases. For example, receipt of speech/language pathology services increased markedly among students with visual impairments (12 percentage points, $p<.01$) but not among those with speech impairments; receipt of physical therapy increased for students with hearing or visual impairments (4 and 10 percentage points, $p<.05$) but not among those with orthopedic impairments. This finding may result from the fact that the categories of students for whom particular services seem most directly relevant already were the most likely to be receiving them.

Health services show the most widespread increases, with five categories of students showing significant gains, ranging from 6 to 19 percentage points ($p<.05$ to $p<.001$). Notably, students with learning disabilities show no increases in receipt of any related services.

Differential Changes in Students' School Programs across Grade Levels

Students in NLTS and NLTS2 whose school programs are analyzed in this report spanned the middle and high school grade levels.[6] Given the differences in structure and emphasis in middle and high schools, it is reasonable to expect that some of the changes in school programs addressed thus far occurred differently among students at different grade levels. For example, it is possible that increases in taking some kinds of academic courses would be most evident in high school, in response to increased graduation or college entrance requirements. This section examines aspects of students' school programs that changed differentially across grade levels.[7]

Academic Course Taking

Although there are no significant differences for students across grade levels in changes in any academic or language arts course taking, participation in other kinds of academic classes changed significantly, often differentially across grade levels (Exhibit 3-13). For example, the increase in taking mathematics classes that was noted previously for students with disabilities as a whole occurred entirely among students in grade 10 or above; no changes are noted for middle school students or high school freshmen. The increase is particularly large for juniors (27 percentage points, $p<.001$). In contrast, significant increases in science course taking are noted across the grade span, although juniors again show the largest increase (37 percentage points, $p<.001$) and middle school students and high school freshmen the smallest (12 and 13 percentage points, $p<.01$). Increases in foreign language course taking also occurred across the grade span, ranging from 14 to 17 percentage points ($p<.05$ to $p<.001$). Social studies course taking increased at all grade levels except among seniors, ranging from 11 to 21 percentage points ($p<.05$ to $p<.001$).

Despite significant increases in their mathematics and science course taking, cohort 2 seniors with disabilities were significantly less likely to be taking those courses than other high school students with disabilities (74% of seniors vs. 92% of juniors taking mathematics, $p<.001$, and 60% vs. 75% taking science, $p<.05$). They also were less likely than juniors to be taking social studies (81% vs. 93%, $p<.05$). These differences may have resulted because seniors had met the credit requirements for those subjects in earlier years and chose not to take additional core academic courses in their senior year. A reduction in academic course taking could provide seniors with the opportunity to take nonacademic electives that would support achievement of their transition goals.

[6] For convenience, grades 7 and 8 are referred to as middle school grade levels and grades 9 through 12 are referred to as high school grade levels.

[7] Students with disabilities who were not assigned to a grade level are not included in the analyses in this section.

Exhibit 3-13
CHANGES IN ACADEMIC COURSE TAKING IN ANY SETTING BY STUDENTS WITH DISABILITIES, BY GRADE LEVEL

	7th or 8th Grade	9th Grade	10th Grade	11th Grade	12th Grade
Percentage taking:					
Mathematics					
Cohort 1 (1985-86/1986-87)	96.7 (1.8)	96.0 (1.5)	86.6 (2.5)	65.5 (3.9)	49.7 (5.4)
Cohort 2 (2001-02)	99.3 (.9)	98.0 (1.3)	97.0 (1.4)	92.3 (2.3)	73.7 (5.1)
Percentage-point change	+2.6	+2.0	**+10.4*** **	**+26.8*** **	**+24.0*** **
Science					
Cohort 1 (1985-86/1986-87)	86.4 (3.5)	79.2 (3.2)	68.2 (3.4)	38.0 (4.0)	33.7 (5.1)
Cohort 2 (2001-02)	98.3 (1.5)	91.9 (2.5)	90.0 (2.4)	75.2 (3.8)	60.3 (5.8)
Percentage-point change	**+11.9** **	**+12.7** **	**+21.8*** **	**+37.2*** **	**+26.6*** **
Social studies					
Cohort 1 (1985-86/1986-87)	84.7 (3.7)	74.6 (3.4)	66.6 (3.4)	80.9 (3.2)	83.5 (4.0)
Cohort 2 (2001-02)	97.4 (1.8)	85.8 (3.2)	88.0 (2.7)	93.1 (2.2)	80.6 (4.6)
Percentage-point change	**+12.7** **	**+11.2* **	**+21.4*** **	**+12.2** **	-2.9
A foreign language					
Cohort 1 (1985-86/1986-87)	8.0 (2.8)	6.3 (1.9)	4.8 (1.6)	6.9 (2.1)	4.4 (2.2)
Cohort 2 (2001-02)	21.7 (4.6)	21.4 (3.6)	21.5 (3.3)	23.7 (3.6)	18.5 (4.4)
Percentage-point change	**+13.7* **	**+15.1*** **	**+16.7*** **	**+16.8*** **	**+14.1** **

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only factors for which there was a significant change for at least one category of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Nonacademic Course Taking

No consistent pattern across grade levels is found regarding changes in taking various kinds of nonacademic courses by students with disabilities (Exhibit 3-14). Significant increases in overall course taking are found only for juniors (12 percentage points, $p<.05$). However, the largest increase in taking fine arts courses occurred among middle school students (28 percentage points, $p<.001$), with increases also noted for sophomores and juniors (21 and 23 percentage points, $p<.001$). The significant increases in life skills course taking were among freshmen and sophomores (11 and 12 percentage points, $p<.05$). Finally, the overall decline in vocational education course taking that was noted previously for students with disabilities as a whole occurred only among students who were in 10th grade or above; declines were 15 and 16 percentage points across those grade levels ($p<.05$ and $p<.01$). This pattern suggests that older students with disabilities in cohort 2 were not taking the more advanced courses in a particular occupational sequence that could prepare them to assume jobs in those occupational areas or provide the prerequisite skills for more advanced training upon leaving high school.

Exhibit 3-14
CHANGES IN NONACADEMIC COURSE TAKING IN ANY SETTING BY STUDENTS WITH DISABILITIES, BY GRADE LEVEL

	7th or 8th Grade	9th Grade	10th Grade	11th Grade	12th Grade
Percentage taking:					
Any nonacademic course					
Cohort 1 (1985-86/1986-87)	92.6	90.2	80.9	73.1	76.4
	(2.7)	(2.3)	(2.9)	(3.7)	(4.6)
Cohort 2 (2001-02)	95.6	95.7	87.5	85.3	81.7
	(2.3)	(1.8)	(2.6)	(3.0)	(4.4)
Percentage-point change	+3.0	+5.5	+6.6	**+12.2***	+5.3
Vocational education					
Cohort 1 (1985-86/1986-87)	42.4	64.6	71.7	84.1	82.2
	(5.0)	(3.7)	(3.3)	(3.0)	(4.1)
Cohort 2 (2001-02)	54.9	54.1	56.7	68.3	66.9
	(5.6)	(4.4)	(4.0)	(4.0)	(5.4)
Percentage-point change	+12.5	-10.5	**-15.0****	**-15.8****	**-15.3***
Fine arts/performing arts					
Cohort 1 (1985-86/1986-87)	49.1	36.1	27.1	23.6	27.4
	(5.1)	(3.7)	(3.2)	(3.5)	(4.8)
Cohort 2 (2001-02)	77.3	39.9	47.7	46.7	39.9
	(4.7)	(4.3)	(4.0)	(4.2)	(5.6)
Percentage-point change	**+28.2*****	+3.8	**+20.6*****	**+23.1*****	+12.5
Life skills/study skills					
Cohort 1 (1985-86/1986-87)	28.8	23.0	20.8	26.1	38.0
	(4.6)	(3.3)	(3.0)	(3.6)	(5.2)
Cohort 2 (2001-02)	35.6	34.1	33.1	36.1	31.7
	(5.3)	(4.2)	(3.8)	(4.1)	(5.3)
Percentage-point change	+6.8	**+11.1***	**+12.3***	+10.0	-6.3

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only factors for which there was a significant change over time for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Although seniors were less likely to be taking some academic classes than other high school students, they were not correspondingly more likely to be taking nonacademic classes, suggesting that seniors had a lighter course load overall than students at lower high school grade levels.

Instructional Settings

The significant decline in participation in special education classes that occurred for students with disabilities as a whole is evident for students at all grade levels (Exhibit 3-15). Because of the particularly large decline among high school seniors (31 percentage points, $p<.001$), seniors with disabilities were significantly less likely to be taking any special education classes than students at other high school grade levels (54% vs. 71% to 73%, $p<.01$). In contrast to the lack of change in general education participation noted for students with disabilities as a whole, high school freshmen show a significant increase in the likelihood of taking at least one course in a general education class (8 percentage points, $p<.05$). They also are the only grade level to show a significant increase in the likelihood that their schools had a policy of providing

Exhibit 3-15
CHANGES IN INSTRUCTIONAL SETTINGS OF STUDENTS WITH DISABILITIES, BY GRADE LEVEL

	7th or 8th Grade	9th Grade	10th Grade	11th Grade	12th Grade
Percentage receiving any instruction in:					
General education classes					
Cohort 1 (1985-86/1986-87)	89.5	85.1	87.0	90.3	91.3
	(3.0)	(2.7)	(2.4)	(2.4)	(2.9)
Cohort 2 (2001-02)	95.3	93.4	87.9	87.9	85.3
	(2.4)	(2.2)	(2.6)	(2.8)	(4.1)
Percentage-point change	+5.8	**+8.3***	+.9	-2.4	-6.0
Special education classes					
Cohort 1 (1985-86/1986-87)	93.4	91.4	87.0	92.1	85.5
	(2.4)	(2.1)	(2.4)	(2.2)	(3.7)
Cohort 2 (2001-02)	69.1	72.5	71.3	72.6	54.2
	(5.2)	(4.0)	(3.6)	(3.8)	(5.7)
Percentage-point change	**-24.3*****	**-18.9*****	**-15.7*****	**-19.5*****	**-31.3*****

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only factors for which there was a significant change over time for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, ***=p<.001.

smaller classes or smaller student loads to general education teachers who had students with disabilities in their classes (a 32-percentage-point increase, p<.001). Of other supports provided to general education teachers that were investigated in NLTS and NLTS2, only providing inservice training on the needs of students with disabilities changed differentially for students across the grade range; high school juniors and seniors were the only students whose schools were more likely to provide this form of general education teacher support.

Students in middle and high school show differences in some of these changes. Increases in the prevalence of policies regarding inservice training were more common among schools attended by juniors and seniors in high school than by students at other grade levels (33 and 36 percentage points vs. 20 to 24 percentage points for other grade levels). However, the increase in policies to provide smaller classes was much greater in schools attended by 9th-grade students (32 percentage points vs. 14 to 24 percentage points at other grade levels).

Instructional settings for academic courses. Ninth graders show the only widespread change in instructional settings for academic courses (Exhibit 3-16). Cohort 2 high school freshmen were significantly more likely to be taking every kind of academic course in a general education class than were their peers in cohort 1, ranging from a 14-percentage-point increase in the proportion of freshmen with disabilities taking any academic course in general education classes to a 21-percentage-point increase among freshmen with disabilities who were taking science in general education classes. For all kinds of courses except mathematics, these increases were accompanied by significant declines in taking courses in special education classes. (There were no significant changes in mathematics course taking in special education classes for students at any grade level.)

Exhibit 3-16
CHANGES IN ACADEMIC COURSE TAKING BY STUDENTS WITH DISABILITIES, BY INSTRUCTIONAL SETTING AND GRADE LEVEL

	7th or 8th Grade	9th Grade	10th Grade	11th Grade	12th Grade
Percentage taking course in setting:					
Any academic course					
General education class					
Cohort 1 (1985-86/1986-87)	66.3	62.3	64.9	62.0	66.1
	(4.9)	(3.8)	(3.5)	(4.1)	(5.2)
Cohort 2 (2001-02)	76.3	76.6	70.9	66.1	71.5
	(4.8)	(3.8)	(3.7)	(4.0)	(5.3)
Percentage-point change	+10.0	**+14.3****	+6.0	+4.1	+5.4
Special education class					
Cohort 1 (1985-86/1986-87)	70.9	75.0	66.8	65.1	63.8
	(4.7)	(3.4)	(3.5)	(4.0)	(5.2)
Cohort 2 (2001-02)	62.2	59.1	59.0	61.6	45.9
	(5.4)	(4.4)	(4.0)	(4.1)	(5.8)
Percentage-point change	-8.7	**-15.9****	-7.8	-3.5	**-17.9***
Language arts					
General education class					
Cohort 1 (1985-86/1986-87)	49.4	40.1	47.4	42.9	48.7
	(5.2)	(3.9)	(3.7)	(4.2)	(5.7)
Cohort 2 (2001-02)	47.9	55.2	47.6	46.1	56.3
	(5.6)	(4.5)	(4.1)	(4.4)	(6.0)
Percentage-point change	-1.5	**+15.1***	+.2	+3.2	+7.6
Special education class					
Cohort 1 (1985-86/1986-87)	67.1	64.7	60.0	61.9	56.6
	(4.9)	(3.8)	(3.6)	(4.1)	(5.7)
Cohort 2 (2001-02)	57.5	50.6	54.6	57.3	44.0
	(5.6)	(4.5)	(4.1)	(4.4)	(6.0)
Percentage-point change	-9.6	**-14.1***	-5.4	-4.6	-12.6
Mathematics					
General education class					
Cohort 1 (1985-86/1986-87)	48.2	43.2	49.0	47.6	50.5
	(5.2)	(3.9)	(3.9)	(5.0)	(7.3)
Cohort 2 (2001-02)	49.3	57.8	55.9	51.8	53.0
	(5.7)	(4.5)	(4.1)	(4.5)	(6.8)
Percentage-point change	+1.1	**+14.6***	+6.9	+4.2	+2.5

Exhibit 3-16
CHANGES IN ACADEMIC COURSE TAKING BY STUDENTS WITH DISABILITIES, BY INSTRUCTIONAL SETTING AND GRADE LEVEL (Concluded)

	7th or 8th Grade	9th Grade	10th Grade	11th Grade	12th Grade
Percentage taking course in setting:					
Science					
General education class					
Cohort 1 (1985-86/1986-87)	63.1	53.5	60.0	60.0	68.8
	(5.3)	(4.4)	(4.3)	(6.3)	(8.9)
Cohort 2 (2001-02)	68.8	74.3	65.1	59.9	72.0
	(5.3)	(4.2)	(4.1)	(4.9)	(6.8)
Percentage-point change	+5.7	**+20.8*** **	+5.1	-.1	+3.2
Special education class					
Cohort 1 (1985-86/1986-87)	38.2	47.6	40.9	40.5	37.6
	(5.3)	(4.4)	(4.3)	(6.3)	(9.3)
Cohort 2 (2001-02)	33.6	30.9	37.8	42.8	30.5
	(5.4)	(4.4)	(4.2)	(5.0)	(7.0)
Percentage-point change	-4.6	**-16.7****	-3.1	2.3	-7.1
Social studies					
General education class					
Cohort 1 (1985-86/1986-87)	58.2	50.8	56.1	55.6	59.3
	(5.5)	(4.5)	(4.5)	(4.6)	(5.9)
Cohort 2 (2001-02)	69.0	71.2	63.1	60.8	63.4
	(5.3)	(4.4)	(4.2)	(4.4)	(6.4)
Percentage-point change	+10.8	**+20.4*** **	+7.0	+5.2	+4.1
Special education class					
Cohort 1 (1985-86/1986-87)	42.6	49.7	44.4	46.5	47.9
	(5.5)	(4.5)	(4.45)	(4.6)	(6.0)
Cohort 2 (2001-02)	32.1	34.2	40.4	40.7	38.7
	(5.4)	(4.6)	(4.3)	(4.4)	(6.4)
Percentage-point change	-10.5	**-15.5***	-4.0	-5.8	-9.2

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only factors for which there was a significant change for at least one category of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

The decrease in special education course participation noted previously for high school seniors resulted entirely from a decrease in participation in special education academic classes overall (18 percentage points, p<.05); no changes in settings for particular kinds of academic classes attain statistical significance.

Instructional settings for nonacademic courses. Changes in instructional settings across types of nonacademic classes were more widespread than those for academic classes (Exhibit 3-17). For example, a decline in taking any nonacademic courses in general education classes occurred among students with disabilities in 10th grade and above, ranging from 12 to 15 percentage points (p<.01 and p<.001). Corresponding increases in special education course taking for any nonacademic subjects were even more consistent, affecting students at all grade levels; increases range from 19 percentage points among seniors (p<.05) to 35 percentage points among juniors (p<.001). Changes across grade levels resulted largely from marked shifts of life skills or study skills classes over time from general education to special education settings for students at all grade levels except ninth grade. In contrast, 9th graders are the only group to

Exhibit 3-17
CHANGES IN NONACADEMIC COURSE TAKING BY STUDENTS WITH DISABILITIES, BY INSTRUCTIONAL SETTING AND GRADE LEVEL

	7th or 8th Grade	9th Grade	10th Grade	11th Grade	12th Grade
Percentage taking course in setting:					
Any nonacademic course					
General education class					
Cohort 1 (1985-86/1986-87)	94.5	92.8	95.1	95.6	97.1
	(2.4)	(2.1)	(1.8)	(1.9)	(2.1)
Cohort 2 (2001-02)	93.9	91.4	83.1	81.3	82.0
	(2.7)	(2.6)	(3.2)	(3.6)	(4.9)
Percentage-point change	-.6	-1.4	**-12.0****	**-14.3*****	**-15.1****
Special education class					
Cohort 1 (1985-86/1986-87)	12.3	21.4	16.8	13.9	17.1
	(3.3)	(5.0)	(2.9)	(3.3)	(4.7)
Cohort 2 (2001-02)	40.5	46.2	47.9	48.5	36.4
	(5.6)	(4.6)	(4.2)	(4.6)	(6.1)
Percentage-point change	**+28.2*****	**+24.8*****	**+31.1*****	**+34.6*****	**+19.3***
Fine/performing arts					
General education class					
Cohort 1 (1985-86/1986-87)	92.2	78.4	84.9	91.6	96.6
	(4.0)	(5.6)	(5.0)	(4.4)	(3.5)
Cohort 2 (2001-02)	95.0	92.8	84.0	88.0	92.7
	(2.9)	(3.5)	(4.1)	(4.2)	(4.6)
Percentage-point change	+2.8	**+14.4***	-.9	-3.6	-3.9
Special education class					
Cohort 1 (1985-86/1986-87)	7.8	22.7	15.1	8.5	4.0
	(4.0)	(5.7)	(5.0)	(4.4)	(3.8)
Cohort 2 (2001-02)	5.3	7.7	15.3	10.1	8.1
	(2.9)	(3.6)	(4.0)	(3.9)	(4.9)
Percentage-point change	-2.5	**-15.0***	+.2	+1.6	+4.1
Life skills/study skills					
General education class					
Cohort 1 (1985-86/1986-87)	84.3	55.3	63.5	80.5	76.3
	(6.4)	(7.8)	(7.4)	(6.2)	(7.7)
Cohort 2 (2001-02)	34.9	46.5	34.0	35.4	35.4
	(7.2)	(7.4)	(6.1)	(6.4)	(9.1)
Percentage-point change	**-49.4*****	-8.8	**-29.5****	**-45.1*****	**-40.9*****
Special education class					
Cohort 1 (1985-86/1986-87)	16.8	45.4	36.9	21.1	23.8
	(6.6)	(7.8)	(7.4)	(6.4)	(7.7)
Cohort 2 (2001-02)	57.6	49.6	65.4	64.5	51.3
	(7.5)	(7.4)	(6.1)	(6.4)	(9.5)
Percentage-point change	**+40.8*****	+4.2	**+28.5****	**+43.4*****	**+27.5***

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only factors for which there was a significant change for at least one category of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: * p<.05, ** p<.01, *** p<.001.

show a significant increase in taking fine arts or performing arts courses in general education classes (14 percentage points, $p<.05$), with a decline in taking such courses in special education classes of similar magnitude (15 percentage points, $p<.05$).

Related Services

There are very few differences across grade levels in the extent to which students with disabilities show changes in the receipt of the various related services investigated in NLTS and NLTS2. Exceptions are a 10-percentage-point increase in receipt of mental health services and a 6-percentage-point increase in receipt of health services among 10th-grade students with disabilities ($p<.05$ and $p<.01$) and an 8-percentage-point increase in receipt of social work services among high school juniors ($p<.05$).

Differential Changes in Students' School Programs across Demographic Groups

This section examines aspects of students' school programs that changed differentially over time for boys and girls with disabilities and for students who differed in their household income and racial/ethnic background.

Differential Changes in School Programs Related to Gender

For the most part, boys and girls with disabilities show similar changes in their school programs over time. However, there are some notable exceptions, most of which closed the gap in course taking that existed among cohort 1 boys and girls (Exhibit 3-18). Regarding academic course taking, although both boys and girls with disabilities show significant increases in enrollment in foreign language courses, the increase is twice as large among boys (18 percentage points, $p<.001$, compared with 9 percentage points for girls, $p<.01$), eliminating the significant difference in taking such courses that existed in cohort 1 (4% for boys vs. 9% for girls, $p<.05$).

The increase in enrollment in nonacademic courses among students with disabilities overall occurred entirely among boys with disabilities, who show a 9-percentage-point increase in nonacademic course enrollment. Enrollment in fine arts courses increased more among boys (16 percentage points, $p<.001$) than among girls (11 percentage points, $p<.05$), again eliminating the difference between cohort 1 boys and girls in taking such courses (30% vs. 42%, $p<.01$). Similarly, the significant increase in students with disabilities taking life skills courses occurred only among boys, with a 14-percentage-point increase in life skills course enrollment ($p<.001$). This change eliminated the significant gender difference in life skills course taking that existed in cohort 1 (20% of cohort 1 boys were taking life skills, compared with 42% of girls, $p<.001$). The decline in vocational education course taking among students with disabilities as a whole also occurred entirely among boys (12 percentage points, $p<.01$).

There also were some differences between genders regarding changes in instructional settings. Specifically, although both cohort 2 boys and girls were less likely than their cohort 1 peers to take courses in special education settings, the decline was somewhat larger among boys than among girls (21 vs. 16 percentage points, $p<.001$ for both comparisons). In contrast, the increase in receiving instruction in a vocational center occurred entirely among girls (6 percentage points, $p<.01$).

Exhibit 3-18
CHANGES IN THE SCHOOL PROGRAMS OF STUDENTS WITH DISABILITIES, BY GENDER

	Boys			Girls		
	Cohort 1 (1985-86/ 1986-87)	Cohort 2 (2001-02)	Percentage-Point Change	Cohort 1 (1985-86/ 1986-87)	Cohort 2 (2001-02)	Percentage-Point Change
Percentage taking:						
A foreign language	4.4 (1.0)	22.5 (2.1)	**18.1*** **	8.9 (2.0)	18.2 (2.7)	**+9.3** **
Any nonacademic course	80.6 (2.0)	89.4 (1.5)	**+8.8*** **	90.0 (2.1)	88.2 (2.3)	-1.8
Vocational education	74.0 (2.2)	62.3 (2.4)	**-11.7** **	62.0 (3.5)	58.5 (3.4)	-3.5
Fine arts/performing arts	29.8 (2.3)	46.3 (2.5)	**+16.5*** **	42.0 (3.5)	53.3 (3.5)	**+11.3***
Life skills/study skills	19.9 (2.0)	34.1 (2.4)	**+14.2*** **	42.1 (3.5)	38.1 (3.4)	-4.0
Percentage taking any course in:						
A special education class	90.1 (1.4)	68.9 (2.3)	**-21.2*** **	87.8 (2.2)	71.9 (3.2)	**-15.9*** **
A vocational center	3.2 (.9)	6.3 (1.2)	+3.1	1.8 (.9)	7.5 (1.9)	**+5.7** **
Percentage taking course in setting:						
Any academic course in special education	70.2 (2.3)	58.6 (2.5)	**-11.6*** **	69.2 (3.4)	60.2 (3.5)	-9.0
Math in general education	45.3 (2.8)	54.6 (2.6)	**+9.3***	40.2 (3.9)	49.1 (3.7)	+8.9
Any nonacademic course in general education	93.5 (1.4)	84.7 (1.9)	**-8.8*** **	94.6 (1.7)	81.9 (2.9)	**-12.7*** **
Life skills/study skills in:						
A general education class	55.5 (5.4)	36.1 (3.7)	**-19.4** **	70.7 (4.7)	35.3 (5.1)	**-35.4*** **
A special education class	44.6 (5.4)	62.7 (3.8)	**+18.1** **	27.4 (4.7)	56.4 (5.3)	**+27.0*** **
Percentage receiving from their school:						
Health services	3.4 (.9)	5.9 (1.3)	+2.5	2.5 (1.1)	7.2 (2.0)	**+4.7***
Assistive devices/adaptations	2.7 (.8)	7.6 (1.4)	**+4.9*** **	3.6 (1.3)	8.6 (2.2)	+5.0

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only factors for which there was a significant change in at least one category of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Patterns of change in the instructional settings in which boys and girls with disabilities were taking specific kinds of courses also differ. Boys with disabilities who were taking academic courses show a significant decline in taking academic courses in special education settings (12 percentage points, $p<.001$) that is not evident among girls (9 percentage points, not statistically significant). In contrast, girls with disabilities who were taking nonacademic courses in general and life skills or study skills in particular show larger declines in the likelihood that they were in general education classrooms. Girls show a 13-percentage-point decline in taking nonacademic courses in general education classrooms ($p<.001$) and a 35-percentage-point reduction in their life skills courses occurring in that setting ($p<.001$), compared with 9- and 19-percentage-point declines among boys with disabilities ($p<.001$ and $p<.01$). Consistent with this pattern, girls' life skills course taking in special education settings increased more than boys' (27 percentage points, $p<.001$, compared with 18 percentage points for boys, $p<.01$).

Finally, regarding related services provided to students with disabilities, only the increases in provision of health services and assistive devices differs between genders. The increase in health services is statistically significant only among girls with disabilities (5 percentage points, $p<.05$), whereas the increase in provision of assistive devices is significant only for boys (5 percentage points, $p<.01$).

Differential Changes in School Programs Related to Household Income and Racial/Ethnic Background

Academic course taking. Reflecting the experiences of students with disabilities as a whole, there were no significant increases for any income or racial/ethnic group in either academic course taking overall or in taking language arts. However, enrollment in other kinds of academic courses increased over time for students at all income levels (Exhibit 3-19). Yet, there is no consistent pattern of increases across income groups. For example, math course taking increased the most among students from households with the lowest incomes (12 percentage points, $p<.01$), whereas enrollment in foreign language courses increased the most for those in the highest income category (20 percentage points, $p<.001$). This increase in foreign language course taking among wealthier students with disabilities resulted in their having a significantly higher likelihood of taking such classes than other students (27% vs. 18% and 16%, $p<.05$ for both comparisons).

White, African-American, and Hispanic students with disabilities all show increases in enrollment in some kinds of academic courses. However, compared with their peers in other racial/ethnic groups, Hispanic students show the largest increases over time in science, social studies, and foreign language course taking—from 18 to 35 percentage points ($p<.05$ to $p<.001$).

Exhibit 3-19
CHANGES IN ACADEMIC COURSE TAKING BY STUDENTS WITH DISABILITIES, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity		
	Lowest	Middle	Highest	White	African American	Hispanic
Percentage taking:						
Mathematics						
Cohort 1 (1985-86/1986-87)	82.2 (3.4)	84.3 (3.0)	80.5 (2.7)	81.1 (1.9)	83.2 (3.5)	83.5 (6.0)
Cohort 2 (2001-02)	94.0 (1.8)	92.2 (2.2)	91.1 (2.3)	93.0 (1.3)	91.9 (2.5)	90.9 (3.5)
Percentage-point change	**+11.8****	**+7.8***	**+10.6***	**+11.9*****	**+8.7***	+7.4
Science						
Cohort 1 (1985-86/1986-87)	63.0 (4.3)	62.1 (4.0)	62.2 (3.3)	60.6 (2.4)	70.0 (4.3)	49.4 (8.1)
Cohort 2 (2001-02)	83.7 (2.8)	82.1 (3.1)	82.9 (3.0)	82.7 (1.9)	83.5 (3.4)	84.0 (4.6)
Percentage-point change	**+20.7*****	**+20.0*****	**+20.7*****	**+22.1*****	**+13.5***	**+34.6*****
Social studies						
Cohort 1 (1985-86/1986-87)	75.5 (3.8)	72.5 (3.7)	75.1 (2.9)	73.5 (2.2)	78.6 (3.8)	72.3 (7.3)
Cohort 2 (2001-02)	88.2 (2.4)	88.5 (2.6)	87.2 (2.7)	88.3 (1.6)	86.5 (3.1)	89.8 (3.7)
Percentage-point change	**+12.7****	**+16.0*****	**+12.1****	**+14.8*****	+7.9	**+17.5***
A foreign language						
Cohort 1 (1985-86/1986-87)	6.0 (2.1)	5.5 (1.9)	7.6 (1.8)	5.3 (1.1)	4.3 (1.9)	16.2 (6.0)
Cohort 2 (2001-02)	17.6 (2.8)	16.2 (3.0)	27.2 (3.5)	18.6 (2.0)	15.9 (3.3)	40.0 (5.9)
Percentage-point change	**+11.6****	**+10.7****	**+19.6*****	**+13.3*****	**+11.6****	**+23.8****

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only courses for which there was a significant change for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Nonacademic course taking. No significant changes in physical education enrollment are noted for any income or racial/ethnic group. However, other changes in nonacademic course taking occurred differently across these groups (Exhibit 3-20). Students from households in the lowest income group show the only significant increase over time in taking any nonacademic course (8 percentage points, $p<.05$) and in taking life skills or study skills courses (14 percentage points, $p<.01$). In contrast, students from wealthier families show the only decrease in vocational course taking (16 percentage points, $p<.001$). Both of these groups show significant increases in enrollment in fine arts courses (15 and 13 percentage points, $p<.01$ and $p<.05$). The middle income group shows no changes over time in nonacademic course taking.

Changes in nonacademic course taking are noted for white and African-American students with disabilities. African-American students show the only significant increase in nonacademic course taking overall (8 percentage points, $p<.05$). They also show the largest increase in

Exhibit 3-20
CHANGES IN NONACADEMIC COURSE TAKING BY STUDENTS WITH DISABILITIES, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity		
	Lowest	Middle	Highest	White	African American	Hispanic
Any nonacademic course						
Cohort 1 (1985-86/1986-87)	81.7 (3.4)	86.1 (2.9)	83.6 (2.5)	84.0 (1.8)	83.5 (3.5)	82.7 (6.2)
Cohort 2 (2001-02)	89.7 (2.2)	87.5 (2.7)	88.4 (2.5)	88.7 (1.6)	92.0 (2.4)	84.0 (4.4)
Percentage-point change	**+8.0***	+1.4	+4.8	+4.7	**+8.5***	+1.3
Vocational education						
Cohort 1 (1985-86/1986-87)	68.4 (4.1)	72.0 (3.7)	73.7 (3.0)	73.0 (2.2)	64.8 (4.5)	64.0 (7.8)
Cohort 2 (2001-02)	63.5 (3.5)	61.9 (3.9)	57.3 (3.9)	59.8 (2.5)	65.0 (4.3)	59.5 (5.9)
Percentage-point change	-4.9	-10.1	**-16.4*****	**-13.2*****	.2	-4.5
Fine/performing arts						
Cohort 1 (1985-86/1986-87)	32.4 (4.2)	39.5 (4.0)	37.5 (3.3)	34.7 (2.4)	30.9 (4.3)	32.8 (7.6)
Cohort 2 (2001-02)	47.5 (3.7)	44.2 (4.0)	50.5 (3.9)	47.6 (2.5)	51.7 (4.5)	49.2 (6.0)
Percentage-point change	**+15.1****	+4.7	**+13.0***	**+12.9*****	**+20.8*****	+16.4
Life skills/study skills						
Cohort 1 (1985-86/1986-87)	26.5 (3.9)	23.5 (3.5)	29.1 (3.1)	27.4 (2.2)	25.5 (4.1)	23.3 (6.9)
Cohort 2 (2001-02)	40.2 (3.6)	32.2 (3.8)	32.6 (3.7)	35.7 (2.4)	39.3 (4.4)	29.1 (5.4)
Percentage-point change	**+13.7****	+8.7	+3.5	**+8.3***	**+13.8***	+5.8

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only courses for which there was a significant change for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

taking fine arts and life skills or study skills courses (21 and 14 percentage points, p<.001 and p<.05). The pattern of change over time in these courses for African-American students mirrors that of students from the lowest income level, reflecting the fact that African-American students with disabilities are more likely than white students to live in households in poverty (Marder, Levine, Wagner, & Cardoso, 2003). Although Hispanic students also have higher rates of poverty, they do not exhibit higher levels of enrollment in nonacademic courses.

The only decline in vocational education enrollment is noted for white students (13 percentage points, p<.001). This finding also reflects the variations observed for differences related to household income. Students from households with the highest income also had the largest decrease; white students are more likely to be members of these families (Marder, Levine, Wagner, & Cardoso, 2003).

Instructional settings. Similar to students with disabilities as a whole, no income or racial/ethnic groups show changes in the likelihood of taking any general education course, although increases in the likelihood that they were attending schools with policies of providing various forms of support to general education teachers who had students with disabilities in their classes generally occurred similarly across income and racial/ethnic groups. The one exception is that African-American students with disabilities do not show the significant increase in their schools' providing special equipment or materials to teachers for use with students with disabilities that occurred for white students (30 percentage points, $p<.001$) or Hispanic students (29 percentage points, $p<.01$).

Students in all groups show significant declines in their enrollment in special education classes. Declines in special education instruction were largest among students in the highest income group (23 percentage points, $p<.001$, compared with 16 and 20 percentage points for the lowest and middle income groups, $p<.001$) and among white students with disabilities (23 percentage points, $p<.001$, compared with 11 and 18 percentage points for African-American and Hispanic students with disabilities, $p<.01$).

Changes in the settings in which students with disabilities were taking specific kinds of academic courses also differ across income and racial/ethnic groups (Exhibit 3-21). Enrollment in general education academic classes as a whole changed significantly over time only for students in the lowest income group (16 percentage points, $p<.01$). They also show the only significant increases in general education courses in math (12 percentage points, $p<.05$), science (18 percentage points, $p<.05$), and social studies (16 percentage points, $p<.01$). An accompanying decline in special education academic course taking for this group occurred only for social studies courses (17 percentage points, $p<.01$). Students from middle- and higher-income households show significant changes only with regard to declines in enrollment in any special education academic class (13 and 11 percentage points, $p<.05$ for both changes).

Racial/ethnic differences in instructional settings for academic courses also are noted. Specifically, none of the changes in settings for academic courses that were noted previously for students with disabilities as a whole were shared by African-American students. Except for language arts, white students show consistent increases in general education academic class enrollment, including 7-percentage-point increases in taking any general education class and in enrollment in general education math courses ($p<.05$ for both increases), an 8-percentage-point-increase in general education science course enrollment ($p<.05$), and a 10-percentage-point increase in general education social studies course enrollment ($p<.01$). White students also show a significant decline in their participation in special education academic courses overall (13 percentage points, $p<.001$) and 10- and 8-percentage-point declines in language arts and social studies courses taught in special education settings ($p<.01$ and $p<.05$). With a 23-percentage-point increase in their rate of enrollment in general education academic courses ($p<.05$), Hispanic students show the largest increase in general education academic course taking. Although percentage-point changes for Hispanic students' enrollment in some specific types of general education classes also are large, none reach statistical significance.

Exhibit 3-21
CHANGES IN INSTRUCTIONAL SETTINGS FOR ACADEMIC COURSES, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity		
	Lowest	Middle	Highest	White	African American	Hispanic
Percentage taking course in setting						
Any academic course						
General education class						
Cohort 1 (1985-86/1986-87)	45.1	64.9	73.2	67.0	47.9	45.8
	(4.5)	(4.0)	(3.0)	(2.4)	(4.8)	(8.4)
Cohort 2 (2001-02)	61.0	69.1	79.0	74.2	58.8	68.9
	(3.6)	(3.8)	(3.2)	(2.2)	(4.5)	(5.6)
Percentage-point change	**+15.9****	+4.2	+5.8	**+7.2***	+10.9	**+23.1***
Special education class						
Cohort 1 (1985-86/1986-87)	79.9	71.5	58.7	66.5	79.3	69.8
	(3.6)	(3.8)	(3.4)	(2.4)	(3.9)	(7.7)
Cohort 2 (2001-02)	70.8	58.1	48.1	53.8	73.0	62.6
	(3.4)	(4.0)	(4.0)	(2.5)	(4.0)	(5.9)
Percentage-point change	-9.1	**-13.4***	**-10.6***	**-12.7*****	-6.3	-7.2
Language arts course						
Special education class						
Cohort 1 (1985-86/1986-87)	75.6	62.4	52.2	58.6	74.9	67.1
	(3.9)	(4.1)	(3.5)	(2.5)	(4.2)	(8.1)
Cohort 2 (2001-02)	66.4	52.9	44.8	48.9	69.4	57.1
	(3.6)	(4.2)	(4.0)	(2.6)	(4.3)	(6.1)
Percentage-point change	-9.2	-9.5	-7.4	**-9.7****	-5.5	-10.0
Math course						
General education class						
Cohort 1 (1985-86/1986-87)	29.8	45.1	59.8	49.3	32.2	33.7
	(4.5)	(4.5)	(3.7)	(2.8)	(4.8)	(8.5)
Cohort 2 (2001-02)	41.5	52.5	64.6	56.7	41.6	49.7
	(3.8)	(4.3)	(3.9)	(2.6)	(4.6)	(6.2)
Percentage-point change	**+11.7***	+7.4	+4.8	**+7.4***	+9.4	+16.0
Science course						
General education class						
Cohort 1 (1985-86/1986-87)	41.8	61.7	67.4	62.4	46.2	47.3
	(5.6)	(5.2)	(4.1)	(3.1)	(5.8)	(11.5)
Cohort 2 (2001-02)	57.6	65.0	74.8	70.5	54.0	66.0
	(4.1)	(4.4)	(3.8)	(2.6)	(5.0)	(6.5)
Percentage-point change	**+17.6***	+10.3	+7.4	**+8.1***	+7.8	+18.7
Social studies course						
General education class						
Cohort 1 (1985-86/1986-87)	37.6	53.6	65.5	59.4	41.5	39.2
	(5.0)	(4.9)	(3.7)	(2.9)	(5.45)	(9.3)
Cohort 2 (2001-02)	55.2	63.9	70.2	69.4	50.5	60.0
	(4.0)	(4.3)	(3.9)	(2.5)	(4.9)	(6.4)
Percentage-point change	**+15.8****	+7.6	+4.7	**+10.0****	+9.0	+20.8
Special education class						
Cohort 1 (1985-86/1986-87)	64.3	48.2	36.1	42.3	60.1	61.2
	(5.0)	(4.96)	(3.8)	(2.9)	(5.3)	(9.3)
Cohort 2 (2001-02)	47.4	38.9	31.3	33.9	52.5	40.7
	(4.0)	(4.4)	(4.0)	(2.6)	(4.9)	(6.4)
Percentage-point change	**-16.9****	-9.3	-4.8	**-8.4***	-7.6	-20.5

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only courses for which there was a significant change for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

There were declines of between 9 and 11 percentage points for students across the income groups in their enrollment in any general education nonacademic course ($p<.05$ and $p<.01$; Exhibit 3-22). Corresponding increases are seen for enrollment in any nonacademic special education class; students in the middle income category show a 31-percentage-point increase ($p<.001$), those in the highest category a 29-percentage-point increase ($p<.001$), and those in the lowest income group a 21-percentage-point gain ($p<.001$). Large declines (39 and 32 percentage points, $p<.001$) are noted for enrollment in general education life skills or study skills courses among those in the middle and highest income categories; conversely, large increases (32 and 28 percentage points, $p<.001$) are seen for these same groups in their enrollment in life skills or study skills courses taught in special education settings. Students in the lowest income category do not show significant changes in their enrollment in general or special education life skills or study skills courses, and no income group shows a significant change in other kinds of nonacademic courses.

Exhibit 3-22
CHANGES IN INSTRUCTIONAL SETTINGS FOR NONACADEMIC COURSES, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity		
	Lowest	Middle	Highest	White	African American	Hispanic
Percentage taking course in setting						
Any nonacademic course						
General education class						
Cohort 1 (1985-86/1986-87)	90.7 (2.8)	95.3 (1.9)	94.7 (1.7)	95.9 (1.1)	90.0 (3.1)	87.7 (5.8)
Cohort 2 (2001-02)	80.5 (3.1)	84.3 (3.1)	85.9 (2.9)	86.1 (1.8)	78.6 (3.9)	81.1 (5.0)
Percentage-point change	**-10.2***	**-11.0****	**-8.8****	**-9.8*****	**-11.4***	-6.6
Special education class						
Cohort 1 (1985-86/1986-87)	28.2 (4.4)	15.1 (3.2)	16.1 (2.7)	16.4 (2.0)	23.7 (4.4)	36.7 (8.6)
Cohort 2 (2001-02)	49.5 (3.9)	46.2 (4.3)	44.9 (4.2)	43.8 (2.6)	53.1 (4.7)	45.4 (6.3)
Percentage-point change	**+21.3*****	**+31.1*****	**+28.8*****	**+27.4*****	**+29.4*****	+8.7
Life skills/study skills						
General education class						
Cohort 1 (1985-86/1986-87)	49.6 (8.5)	68.7 (7.1)	73.2 (5.4)	65.7 (4.2)	61.7 (8.9)	34.6 (16.0)
Cohort 2 (2001-02)	34.3 (5.0)	29.9 (5.2)	41.2 (6.6)	38.3 (3.8)	23.6 (5.5)	38.9 (9.6)
Percentage-point change	-15.3	**-38.8*****	**-32.0*****	**-27.4*****	**-38.1*****	4.3
Special education class						
Cohort 1 (1985-86/1986-87)	50.4 (8.5)	31.3 (7.1)	26.9 (5.4)	34.3 (4.2)	38.3 (8.9)	65.4 (16.0)
Cohort 2 (2001-02)	62.7 (5.1)	63.3 (5.5)	55.2 (6.7)	57.2 (3.9)	71.9 (5.9)	62.9 (9.5)
Percentage-point change	+12.3	**+32.0*****	**+28.3*****	**+22.9*****	**+33.6****	-2.5

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only courses for which there was a significant change for at least one group of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Changes in instructional settings for nonacademic course taking occurred only for white and African-American students with disabilities; no changes are noted for Hispanic students. White and African-American students show similar declines in general education nonacademic course taking, with increases of similar size in taking such courses in special education classes. However, African-American students with disabilities show a larger decline in taking general education life skills or study skills courses (38 percentage points, $p<.001$) than white students (27 percentage points, $p<.001$) and a corresponding larger increase in special education life skills or study skills course taking (34 percentage points, $p<.01$) than their white peers (23 percentage points, $p<.001$).

Related services. There are few differences across income levels or racial/ethnic groups in the extent of changes in the receipt by students with disabilities of the various related services investigated in NLTS and NLTS2 (Exhibit 3-23). Students in the lowest income category show the only significant increase in receipt of mental health services (10 percentage points, $p<.05$). Health service receipt increased significantly only for those in the middle income category (5 percentage points, $p<.05$). Students in the highest income group and white students show the only significant increases in the receipt of assistive devices and adaptations (7 and 6 percentage points, $p<.05$ and $p<.001$).

Exhibit 3-23
CHANGES IN RELATED SERVICES PROVIDED TO STUDENTS WITH DISABILITIES, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity		
	Lowest	Middle	Highest	White	African American	Hispanic
Percentage with IEP that specified receipt of:						
Mental health services						
Cohort 1 (1985-86/1986-87)	15.6 (3.2)	16.0 (3.0)	10.5 (2.0)	12.4 (1.6)	12.4 (3.1)	22.6 (6.4)
Cohort 2 (2001-02)	26.0 (3.5)	16.5 (3.3)	14.7 (3.1)	16.5 (2.0)	21.0 (4.0)	28.5 (6.1)
Percentage-point change	**+10.4***	+.5	+4.2	+4.1	+8.6	+5.9
Health services						
Cohort 1 (1985-86/1986-87)	4.3 (1.8)	1.1 (.9)	3.3 (1.2)	3.4 (.9)	3.4 (1.7)	0.6 (1.2)
Cohort 2 (2001-02)	6.3 (1.9)	5.9 (2.1)	6.2 (2.1)	6.6 (1.4)	6.7 (2.5)	4.9 (2.9)
Percentage-point change	+2.0	**+4.8***	+2.9	+3.2	+3.3	+4.3
Assistive devices/adaptations						
Cohort 1 (1985-86/1986-87)	3.0 (1.5)	3.2 (1.4)	2.8 (1.1)	2.7 (.8)	3.8 (1.8)	2.5 (2.4)
Cohort 2 (2001-02)	5.8 (1.8)	8.2 (2.4)	9.8 (2.6)	8.3 (1.5)	6.4 (2.4)	8.4 (3.7)
Percentage-point change	+2.8	+5.0	**+7.0***	**+5.6*****	+2.6	+5.9

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, ***=p<.001.

Summary

Students with disabilities have experienced important changes in their school programs since the mid-1980s that in many respects bode well for their future. Cohort 2 high school students with disabilities were much more likely than their cohort 1 counterparts to be taking core academic courses, including mathematics, science, social studies, and a foreign language. And increasingly, students with disabilities who were taking such courses were doing so in general education classes. This increased emphasis on general education academic course taking suggests that more students with disabilities are being offered the academic preparation needed for postsecondary education and employment. Further, they were increasingly likely to be attending schools that had policies of providing a variety of forms of support to their general education teachers, so that their chances of success in their general education classes were enhanced.

However, one apparent trade-off resulting from an increased emphasis on academic course taking is that nonacademic courses, particularly vocational education, which may be beneficial in helping students reach nonacademic transition goals, may be getting pushed out of the course schedules of many students with disabilities. Specifically, vocational course taking declined overall, so that only about 6 in 10 cohort 2 students with disabilities were taking it in spring 2002. This decline is worrisome in light of the fact that NLTS data suggest that vocational education, particularly courses that provide training for specific occupations, contributes to higher rates of employment among youth with disabilities in their early adult years (Wagner, Blackorby, et al., 1993). Declines in vocational course taking were largest among students with learning disabilities and speech impairments, the categories of youth for whom the benefits of vocational education were shown to be strongest in NLTS. However, these are the same students who showed substantial increases in enrollment in academic courses that may prepare them to enroll in postsecondary education at higher rates than were apparent at the time of NLTS. Postsecondary education could well have a beneficial effect on later employment that could equal or surpass that of secondary vocational education.

As participation in general education academic classes increased, there was a corresponding decline in participation in special education academic classes. In fact, 30% of cohort 2 students with disabilities were taking no special education classes at all in the spring of 2002, whereas only 9% of cohort 1 students with disabilities were not taking any special education courses in the 1985-86 or 1986-87 school year. However, this decline in overall special education course taking masks an increase in the likelihood that students with disabilities who were taking nonacademic courses were doing so in special education classes, largely because life skills or study skills instruction increasingly is the purview of special education. As mentioned, vocational education course taking declined over time among high school students, and, as with life skills or study skills courses, cohort 2 students with disabilities who were taking vocational education were more likely than cohort 1 students to be doing so in a special education class.

Several kinds of related services were more likely to be provided to cohort 2 than cohort 1 students, including mental health, social work, and health services; assistive devices and adaptations; and orientation and mobility training. However, each of the 11 kinds of related services investigated in both NLTS and NLTS2 was provided significantly more often to cohort 2 students than to cohort 1 students in at least one disability category. For the most part, increases in receipt of particular services were largest among students in categories for which

they were most directly applicable (e.g., orientation and mobility training increased largely among students with visual impairments, as would be expected), although increases in some kinds of services were more widespread.

However, some changes in school programs occurred to varying degrees for students who differed in their primary disability category. For example, some of the most pronounced changes in school programs occurred among students with multiple disabilities, whose programs differed most from those of other categories of students in cohort 1. They show the only significant increase in overall academic course taking, registering increases in taking every kind of academic course except a foreign language. Consistent with these changes, students with multiple disabilities also are the only category to demonstrate a significant increase in participation in general education classes overall. However, with the exception of language arts classes, most of the increase in general education course taking by students with multiple disabilities involved nonacademic courses, particularly fine arts and physical education. Despite these changes, however, cohort 2 students with multiple disabilities continued to be less likely to take academic or general education courses than students in other disability categories.

Students with multiple disabilities and those with mental retardation also show a significant increase in taking nonacademic courses, including both life skills and vocational education courses; they are the only categories of students to show an increase in their vocational course taking, counter to the decline for students with disabilities as a whole.

Students in other disability categories also have patterns of changes in their school programs that set them apart from their peers. For example, the rate of enrollment in life skills or study skills courses more than doubled among students with emotional disturbances, the only category of students, besides those with multiple disabilities or mental retardation, among whom an increase in life skills or study skills training occurred. Students with emotional disturbances also show the largest increase in receipt of mental health services, as might be expected. In contrast, students with learning disabilities or other health impairments are the only categories of youth to register no increase in receipt of any kind of related service.

Although gender differences in the ways school programs changed are limited, changes in course taking suggest positive trends. Differential rates of change among boys and girls with disabilities in taking some kinds of courses resulted in greater similarity in the course schedules of cohort 2 boys and girls than in the past, suggesting that gender stereotypes that may have influenced course choices have weakened.

In contrast, differential rates of change in some aspects of school programs among students with disabilities in different income and racial/ethnic groups suggest both potentially positive trends and cause for concern. For example, although enrollment in several kinds of academic courses increased among students with disabilities in all income groups, the increase in taking a foreign language was largest among those from households with the highest incomes, significantly widening the gap between income groups in the likelihood of their taking this college preparatory course. The greater emphasis on college preparation among youth with disabilities from higher-income households is also suggested by the fact that they are the only income group to show a significant decline in vocational education course taking. The highest income group also shows the largest decline in special education course taking overall. However, positive changes in school programs also are noted for students with disabilities from low-income households. They are the income group showing the only significant increases in

enrollment in general education academic classes overall and in general education mathematics, science, and social studies classes in particular.

Changes in school programs for students with disabilities of different racial/ethnic backgrounds also are apparent. For example, white students with disabilities show the most consistent pattern of increases in taking academic courses and in taking them in general education classrooms, and they are the only group to register a significant decline in taking academic courses in special education settings. As is true of youth with disabilities from higher-income households, white youth also are the only racial/ethnic group to show a significant decline in vocational course taking. In contrast, although African-American students with disabilities show increases in their rates of taking some kinds of academic courses, none of the increases in taking academic courses in general education classes that are noted among students with disabilities as a whole were shared by African-American students. African-American students with disabilities who were taking life skills courses also show the largest decline in the likelihood that they would be in general education classes and the largest increase in the likelihood that they would be in special education classes. Hispanic students with disabilities show the largest gain in enrollment in general education academic courses of any racial/ethnic group, although they show no changes in their rates of taking nonacademic courses or in the settings in which nonacademic courses were taken.

This chapter has described changes over time in key aspects of the secondary school programs of students with disabilities. These analyses raise the question of whether school reform initiatives have an impact on students' participation in school, the topic addressed in the next chapter.

4. CHANGES IN THE SCHOOL PARTICIPATION OF SECONDARY SCHOOL STUDENTS WITH DISABILITIES

The preceding two chapters document many changes in the schools attended by secondary school students with disabilities and in their educational programs. Are these changes in the educational contexts and experiences of students with disabilities reflected in changes in their school participation? Three dimensions of the school participation of students with disabilities are addressed in both NLTS and NLTS2 and are compared in this chapter:

- School attendance
- Academic performance (i.e., grades reported by teachers)
- School suspensions.

Information on these aspects of students' school participation is drawn from the NLTS school record abstract form, completed by a school staff member for students' most recent year in school—either the 1985-86 or 1986-87 school year. NLTS2 information is taken primarily from the Wave 1 student's school program survey,[1] completed in spring 2002 by the school staff person who was most knowledgeable about each student's overall school program.

Findings are presented for students with disabilities as a whole and for those who differed in their primary disability category, grade level, and selected demographic characteristics, where significant. In addition, links are made between findings reported here and those in an earlier comparison between NLTS and NLTS2 that focused on parents' reports of the experiences of youth, both in and out of school.[2]

School Attendance

School attendance is a basic indicator of being engaged in schooling. Although students with some kinds of disabilities are absent because of illnesses or treatments associated with their disability, some students, both with and without disabilities elect to skip school because of disaffection or alienation from the learning process.[3] Missing many days of school means missing coursework that is often difficult to make up. Students who are absent frequently also lose access to teachers and peers who can promote positive attitudes about and approaches to learning.

Research documents the negative pattern of school performance and behavior that is associated with high absenteeism. Multivariate NLTS2 analyses show that, independent of differences between students in their disability and demographic characteristics; family income, support for education, and expectations for the future; and school programs, higher absenteeism is associated with lower grades, lower achievement in mathematics, and less-positive classroom

[1] One aspect of students' school participation, grades, includes data from the NLTS2 general education teacher survey, as described in the section on academic performance.

[2] These comparisons are reported in Wagner, Cameto, & Newman. (2003).

[3] Statistics on absenteeism for the general population of secondary school students indicate that in the 2000-01 school year, 34% of absences among high school seniors were due to illness, 26% were due to students' skipping school, and 40% were due to other reasons (National Center for Education Statistics, 2002b).

behaviors, such as lower likelihoods of taking part in classroom discussions, staying focused on classwork, and completing homework on time (Newman, Davies-Mercier, et al., 2003). In addition, high absenteeism has been identified as a powerful predictor of academic failure and dropout decisions for students with disabilities (Blackorby & Wagner, 1996; Donahoe & Zigmond, 1990; Schellenberg et al., 1988; Thurlow et al., 2002; Wagner, 1991b).

In both NLTS and NLTS2, school staff who were familiar with the overall school programs and performance of students with disabilities reported the number of days students were absent. For NLTS, respondents reported the total number of days absent in students' most recent school year. Because NLTS2 collected information from schools before the end of the 2001-02 school year, the total number of days absent for the year could not be obtained. Therefore, respondents were asked to report the number of days absent in February 2002. NLTS findings were made comparable to those of NLTS2 by dividing the total number of days absent in the typical 36-week school year by 9 to obtain an estimate of the number of days absent in a 4-week period comparable to the month of February.

According to school staff reports, the average number of days students with disabilities were absent in a 4-week period increased over time by almost a full day (2.6 vs. 1.7 days, $p<.001$; Exhibit 4-1). Although this increase in absenteeism may not seem large, it translates into an additional 8 days of school missed in the school year for cohort 2, for an average absenteeism of 23 days, or more than 4 full weeks of school.

Exhibit 4-1
CHANGES IN THE SCHOOL ABSENTEEISM OF STUDENTS WITH DISABILITIES

	Cohort 1 (1985-86/ 1986-87	Cohort 2 (2001-02)	Change (Days or Percentage Points)
Mean days absent in a 4-week period	1.7 (.1)	2.6 (.2)	**+.9*** **
Percentage with number of days absent in a 4-week period			
None	19.9 (1.5)	33.8 (2.1)	**+13.9*** **
1 day	49.5 (1.9)	20.2 (1.7)	**-29.3*** **
2 or 3 days	19.1 (1.5)	24.5 (1.9)	**+5.4***
4 or more days	11.5 (1.2)	21.5 (1.8)	**+10.0*** **

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, ***=p<.001.

The increase in average absenteeism occurred despite a significant increase of 14 points in the percentage of students with disabilities who had perfect attendance (34% vs. 20%, $p<.001$). However, a 29-percentage-point decrease in the proportion of students who were absent only 1 day in a 4-week period (20% vs. 50%, $p<.001$) was offset by an increase of 5 percentage points in absenteeism of 2 or 3 days ($p<.05$) and a 10-percentage-point increase in absenteeism of 4 days or more ($p<.001$). More than one-fifth of cohort 2 students with disabilities (22%) missed 4 or more days of school in a 4-week period, or 7 weeks or more of school in the school year, with the resulting potential for negative effects on learning.

This trend toward higher absenteeism among students with disabilities, particularly in the percentage of students who were absent more than 1 day, is consistent with findings for the general student population. The percentage of high school seniors in the general population who reported they missed 2 or more days of school in a 4-week period increased from 47% in 1981 to 49% in 1991 and to 51% in 2000 (National Center for Education Statistics, 2002b). Further, the level of absenteeism among seniors with disabilities was quite similar to that for seniors in the general population; about 34% of both groups had perfect attendance, and about half missed 2 or more days of school in a 4-week period.

Academic Performance

Most secondary school students have considerable experience with course grades and report cards. As an indication of teachers' evaluation of students' academic performance, grades provide students with powerful messages about their academic status and abilities, which, over the course of their school careers, can help shape students' self-perceptions of their competence. Further, in high school, a passing grade is required for a course to contribute to accumulated credit for graduation. Grades also provide crucial 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, attitude, 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 of secondary school students with disabilities 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 and daily class work to be important (Newman, Marder, et al., 2003). Differences in grading criteria in general and special education classrooms also have been found for elementary and middle school students with disabilities (Blackorby, Wagner, et al., 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 of academic performance for students with disabilities because they indicate success by a teacher's standards and success relative to other students in a given classroom.

In both NLTS and NLTS2, school staff were asked to report the grades received by students with disabilities, but in different ways.[4] In NLTS, grades were reported for each course taken during students' most recent school year, from which an overall measure of grades was calculated. In NLTS2, current grades were reported in the general education teacher survey for a general education academic class, if the student was taking such a class, and in the student's school program survey for a nonvocational special education class, if the student had such a class in his or her course schedule. NLTS2 analyses incorporate the grades for the setting in which the student took the larger proportion of his or her courses.

There was a significant improvement over time in the grades students with disabilities received (Exhibit 4-2). The proportion of students receiving mostly Cs decreased by 20

[4] See Appendix A for a description of how the overall GPA in NLTS was translated into the grade categories reported in NLTS2.

percentage points (p<.001), with corresponding increases in students receiving mostly As or Bs (16 and 10 percentage points; p<.001 and p<.01). These changes nearly doubled the percentage of students receiving above-average grades, bringing the total to more than half of students with disabilities. There was no change in the percentage of youth who received below-average grades (24% and 19% received mostly Ds or Fs in cohorts 1 and 2, respectively).

Exhibit 4-2
CHANGES IN THE GRADES OF STUDENTS WITH DISABILITIES

	Cohort 1 (1985-86/ 1986-87	Cohort 2 (2001-02)	Percentage-Point Change
Percentage receiving:			
Mostly As	2.8 (.6)	18.6 (2.3)	**+15.8*** **
Mostly Bs	24.3 (1.7)	34.0 (2.8)	**+9.7** **
Mostly Cs	49.1 (1.9)	28.6 (2.7)	**-20.5*** **
Mostly Ds	17.0 (1.5)	14.6 (2.1)	-2.4
Mostly Fs	6.8 (1.0)	4.2 (1.2)	-2.6

Sources: NLTS school record abstract, NLTS2 Wave 1 student's school program survey, and NLTS2 general education teacher survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: **=p<.01, ***=p<.001.

These grade improvements are consistent in direction but not necessarily in scale with those reported for students in the general population for the early part of the time period between NLTS and NLTS2. Comparing grades reported for students in High School and Beyond (1982) and seniors in the National Education Longitudinal Study of 1988 (NELS:88 second follow-up, 1992), Koretz and Berends report inflation of students' overall grade point average that they describe as "mostly very small" (Koretz & Berends, 2001, p. xii)—an increase of 3 points in the percentage of students earning mostly Bs or above.

The pattern of improved grades among students with disabilities may bode well for their social adjustment. Multivariate NLTS2 analyses demonstrate a significant relationship between better grades and lower likelihoods of being subject to disciplinary actions at school and arrest in the community, independent of differences between students in their disability, social skills, demographic characteristics, or school programs (Marder, Wagner, & Sumi, 2003). Further, improved grades are consistent with reports by parents of NLTS and NLTS2 students, which show a 21-percentage-point increase in the proportion of students with disabilities who are at the typical grade level for their age (Wagner, Cameto, et al., 2003). Earning better grades is an important element in maintaining a typical grade-level progression through a student's school career.

School Suspension

The majority of youth in secondary school establish healthy relationships, find socially acceptable ways to engage in activities that interest them, and persevere in school through graduation. However, some adolescents experience more challenges than their peers. When behavior violates the accepted norms at school, negative repercussions can result, such as suspension from school. Students with disabilities include a disproportionate number of students who are at high risk for difficulties in social adjustment and may have positive behavioral supports included as part of their individualized education programs or of behavioral intervention plans. An increase in the adoption of "zero tolerance" policies for behaviors that could be considered threatening or dangerous could be expected to result in increased incidents of disciplinary action

for such students or others who exhibit behaviors that are considered inappropriate or intolerable at school. In fact, "the number of suspensions and expulsions has increased dramatically in recent years" (Phi Delta Kappa Center for Evaluation, Development, and Research, 1998, p. 1). For example, the state of North Carolina reported a 27% increase in long-term suspensions, a 20% increase in short-term suspensions, and a 54% increase in expulsions from the 2000-01 to the 2001-02 school year (Public Schools of North Carolina, 2002).

This increase in disciplinary actions involving the general student population also is apparent among students with disabilities. Although the behavior of the large majority of students with disabilities did not violate school norms in either cohort 1 or 2 to the extent that suspensions resulted (Exhibit 4-3), the percentage of those who had been suspended increased by 8 percentage points ($p<.001$), so that by cohort 2, 20% of students had been suspended during that school year. The increase in overall suspensions resulted from an 8-percentage-point increase in the percentage of students suspended for 1 or 2 days ($p<.001$). However, this change did not significantly affect the average number of days suspended, which remained less than 1 day per year for students with disabilities overall. This finding suggests that although more cohort 2 students had been suspended, the suspensions tended to be shorter than in cohort 1. The reduction in the average number of days suspended from 6 days to 4 days ($p<.05$) among students who had been subject to suspension supports this conclusion.

Exhibit 4-3
CHANGES IN THE SCHOOL SUSPENSIONS OF STUDENTS WITH DISABILITIES

	Cohort 1 (1985-86/ 1986-87	Cohort 2 (2001-02)	Percentage-Point Change
Percentage with:			
Any suspensions	12.0 (1.3)	19.7 (1.8)	**+8.3*** **
1 or 2 days suspended	2.7 (.7)	11.0 (1.4)	**+8.3*** **
3 or more days suspended	9.3 (1.2)	8.7 (1.2)	-.6
Mean days suspended, all students with disabilities	.7 (.1)	.8 (.1)	+.1
Mean days suspended, students with any suspensions	6.1 (.9)	4.0 (.5)	**-2.1***

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, ***=p<.001.

Given the short duration of suspensions experienced by most students who were suspended at all, the provisions in the Individuals with Disabilities Education Act Amendments of 1997 (IDEA '97) regarding longer-term suspensions actually may affect only a few students. IDEA '97 stipulates that if a problematic infraction or behavior is linked to a student's disability, suspensions cannot exceed 10 days without a meeting of the team that plans a student's individualized education program to consider service or placement alternatives, a requirement that was not in effect in 1986. In light of this legislative mandate, it is not surprising that virtually all cohort 2 students with disabilities (95%) were attending schools where school staff reported having a policy of arranging for alternative placements or services for suspended students with disabilities, a 21-percentage-point increase in the likelihood of going to schools with a such a policy ($p<.001$).

The increase in the proportion of students with disabilities who were suspended, as reported by schools, is consistent with parents' reports of whether their adolescent children had experienced one or more of the following negative consequences of behavior: being suspended

or expelled from school, fired from a job, or arrested. Comparisons of NLTS and NLTS2 show a 6-percentage-point increase in this indicator of negative social adjustment between 1987 and 2001 (Wagner, Cameto, et al., 2003).

Increases in suspensions are worrisome because disciplinary actions at school have been shown to correlate highly with poor social skills, poor classroom social behaviors (e.g., getting along with other students), and a higher likelihood of students' being involved in bullying and being arrested (Marder, Wagner, & Sumi, 2003).

Differential Changes in School Participation across Disability Categories

The aspects of students' school participation described thus far reflect both the cognitive and social abilities of students. Given the tremendous diversity among students with disabilities on these and other functional dimensions, it is not surprising that significant differences are noted across disability categories in changes in school participation, as described in the following sections.

School Attendance

The increase in perfect attendance that was reported for students with disabilities as a whole (presented in Exhibit 4-1) occurred for students in all disability categories (Exhibit 4-4), with increases ranging from 11 percentage points for students with emotional disturbances ($p<.05$) to

Exhibit 4-4
CHANGES IN STUDENTS' ABSENTEEISM, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
In a 4-week period:									
Percentage with perfect attendance									
Cohort 1 (1985-86/1986-87)	18.6	19.3	22.0	21.8	20.7	26.1	26.6	24.1	21.0
	(2.3)	(3.3)	(2.5)	(3.1)	(2.8)	(4.3)	(4.2)	(4.7)	(5.0)
Cohort 2 (2001-02)	31.3	38.0	38.4	33.2	46.7	47.6	40.7	43.0	36.9
	(3.1)	(3.5)	(3.3)	(4.1)	(4.1)	(4.9)	(3.6)	(2.9)	(3.7)
Percentage-point change	**+12.7*** **	**+18.7*** **	**+16.4*** **	**+11.4***	**+26.0*** **	**+21.5*** **	**+14.1***	**+18.9*** **	**+15.9***
Percentage absent 4 or more days									
Cohort 1 (1985-86/1986-87)	11.0	6.1	11.6	16.1	5.4	4.6	11.2	13.7	21.0
	(1.8)	(2.0)	(1.9)	(2.8)	(1.5)	(2.1)	(3.0)	(3.8)	(5.0)
Cohort 2 (2001-02)	22.3	15.2	19.9	24.2	14.8	10.0	20.2	16.6	23.0
	(2.8)	(2.6)	(2.7)	(3.7)	(2.9)	(2.9)	(2.9)	(2.2)	(3.2)
Percentage-point change	**+11.3*** **	**+9.1** **	**+8.3***	+8.1	**+9.4** **	+5.4	**+9.0***	+2.9	+2.0
Mean days absent									
Cohort 1 (1985-86/1986-87)	1.7	1.3	1.6	1.9	1.2	1.1	1.5	1.7	1.9
	(.1)	(.1)	(.1)	(.1)	(.1)	(.1)	(.2)	(.2)	(.2)
Cohort 2 (2001-02)	2.7	1.9	2.2	3.1	1.8	1.5	2.1	1.9	2.7
	(.3)	(.2)	(.2)	(.4)	(.3)	(.3)	(.2)	(.2)	(.3)
Change in mean days absent	**+1.0** **	+.6	**+.6** **	**+1.2** **	+.6	+.4	**+.6***	+.2	**+.8***

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

26 percentage points for students with hearing impairments ($p<.001$). With these increases, the percentages of students with perfect attendance range from about one-third to one-half of cohort 2 students across disability categories ($p<.01$ comparing students with hearing or visual impairments and those with learning disabilities).

Nonetheless, increases in relatively high absenteeism also are apparent for students in five of the nine disability categories. Significant increases range from 8 percentage points among students with mental retardation ($p<.05$) to 11 percentage points among students with learning disabilities ($p<.001$). With these changes, the percentages of cohort 2 students who were absent 4 or more days in a 4-week period range from 10% of students with visual impairments to 24% of students with emotional disturbances ($p<.01$).

Increases in high absenteeism resulted in increases in the average number of days absent for students with learning disabilities, mental retardation, or orthopedic impairments (.6 to 1.0 days, $p<.05$ and $p<.01$). In contrast, increases in perfect attendance for students with speech or hearing impairments offset increases in high absenteeism, resulting in no change in the average number of days absent for those groups. Students with emotional disturbances or multiple disabilities show increases in the average days absent (1.2 and .8 days, $p<.01$ and $p<.05$) without an increase in high absenteeism, indicating that the increases occurred among students who missed 1 to 3 days of school in a 4-week period.

Academic Performance

The lack of any change in grades at the lower end of the grade scale found among students with disabilities as a whole (presented in Exhibit 4-2) is apparent for students in every disability category; there were no significant changes in the proportions of students with disabilities receiving mostly Ds or Fs. However, the pattern of receiving fewer Cs and more As and Bs that was reported previously for students with disabilities as a whole did not occur consistently across disability categories (Exhibit 4-5); in fact, there were no significant changes in grades at all for students with mental retardation or other health impairments, despite the fact that they had significant increases in their likelihood of being at the appropriate grade level for their age (Wagner, Cameto, et al., 2003). Only students with learning disabilities or emotional disturbances show significant increases in receiving both mostly As and mostly Bs (16 and 12 percentage points, $p<.001$ and $p<.01$), corresponding to 24- and 18-percentage-point decreases in receiving mostly Cs ($p<.001$ and $P<.01$)).

Significant reductions in receipt of mostly Cs among students with speech, visual, or orthopedic impairments (12 and 18 percentage points, $p<.05$) translated into increases only in the proportions of students receiving mostly As (18 and 23 percentage points, $p<.001$ and $p<.01$), and students with hearing impairments show reductions in receipt of both mostly Cs and mostly Bs (16 and 14 percentage points, $p<.01$ and $p<.05$).

Exhibit 4-5
CHANGES IN STUDENTS' GRADES, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage receiving:									
Mostly As									
Cohort 1 (1985-86/1986-87)	2.4	6.4	3.2	1.0	6.7	11.4	10.2	7.9	4.4
	(.9)	(2.0)	(1.1)	(.7)	(1.7)	(3.3)	(2.8)	(2.9)	(3.3)
Cohort 2 (2001-02)	18.9	24.3	12.1	14.2	32.7	34.6	33.3	15.6	23.1
	(3.2)	(3.5)	(4.6)	(4.0)	(5.4)	(6.3)	(4.6)	(2.8)	(8.4)
Percentage-point change	**+16.5*** **	**+17.9*** **	+8.9	**+13.2** **	**+26.0*** **	**+23.2*** **	**+23.1** **	+7.7	**+18.7***
Mostly Bs									
Cohort 1 (1985-86/1986-87)	22.6	32.6	26.0	20.4	48.6	38.8	45.2	32.9	36.9
	(2.4)	(3.8)	(2.8)	(3.0)	(3.3)	(5.0)	(4.7)	(5.1)	(7.8)
Cohort 2 (2001-02)	35.0	33.3	23.4	32.6	34.5	33.3	34.4	33.1	31.5
	(3.8)	(3.8)	(6.0)	(5.4)	(5.5)	(6.3)	(4.6)	(3.6)	(9.3)
Percentage-point change	**+12.4** **	+.7	-2.6	**+12.2***	**-14.1***	-5.5	-10.8	+.2	-5.4
Mostly Cs									
Cohort 1 (1985-86/1986-87)	52.2	37.4	46.7	44.9	34.7	42.6	33.0	38.6	42.7
	(2.9)	(3.9)	(3.2)	(3.7)	(3.2)	(5.1)	(4.4)	(5.2)	(8.0)
Cohort 2 (2001-02)	28.6	25.4	39.6	26.4	18.3	24.4	21.2	31.9	27.0
	(3.6)	(3.5)	(7.0)	(5.1)	(4.5)	(5.7)	(4.0)	(3.5)	(8.9)
Percentage-point change	**-23.6*** **	**-12.0***	-7.1	**-18.5** **	**-16.4** **	**-18.2***	**-11.8***	-6.7	-15.7

Sources: NLTS school record abstract, NLTS2 Wave 1 student's school program survey, and NLTS2 general education teacher survey.

Note: Only factors for which there was a statistically significant change for at least one category of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Despite fairly widespread improvements in grades, there remain significant differences in cohort 2 students' grades across disability categories. For example, students with mental retardation were significantly less likely to receive mostly As (12%) and more likely to receive mostly Cs (40%) than students in most categories (e.g., 33% and 21% for students with orthopedic impairments, p<.01 and p<.05). Students with visual or hearing impairments tended to have the best grades overall, as well as among the largest increases over time in receiving mostly As (23 and 26 percentage points, p<.001).

School Suspension

The significant increase in the likelihood of being suspended among students with disabilities as a whole (presented in Exhibit 4-3) was fairly widespread, with increases noted for six of nine disability categories (Exhibit 4-6). Increases in the proportions of students with disabilities attending schools with policies to arrange alternative placements and services for suspended students with disabilities also were widespread, occurring for all categories, with increases ranging from 15 to 26 percentage points.

Exhibit 4-6
CHANGES IN SCHOOL SUSPENSIONS, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Multiple Disabilities/ Deaf-blindness
Percentage with any suspensions									
Cohort 1 (1985-86/1986-87)	10.1	8.7	11.0	31.4	7.6	2.4	2.0	6.6	3.3
	(1.9)	(2.5)	(2.0)	(3.8)	(2.0)	(1.6)	(1.4)	(3.0)	(2.5)
Cohort 2 (2001-02)	16.8	11.1	19.1	44.1	10.8	8.9	5.6	21.3	10.3
	(2.5)	(2.2)	(2.7)	(4.4)	(2.5)	(2.6)	(1.6)	(2.4)	(2.3)
Percentage-point change	**+6.7***	+2.4	**+8.1***	**+12.7***	+3.2	**+6.5***	+3.6	**+14.7*****	**+7.0***
Percentage suspended 1 or 2 days									
Cohort 1 (1985-86/1986-87)	2.4	2.5	2.2	6.7	1.8	.3	.6	1.1	.8
	(1.0)	(1.4)	(.9)	(2.1)	(1.0)	(.6)	(.8)	(1.3)	(1.2)
Cohort 2 (2001-02)	10.3	7.3	11.3	20.1	3.8	5.9	3.8	9.2	4.3
	(2.1)	(1.8)	(2.2)	(3.6)	(1.5)	(2.2)	(1.3)	(1.7)	(1.5)
Percentage-point change	**+7.9*****	**+4.8***	**+9.1*****	**+13.4*****	+2.0	**+5.6***	**+3.2***	**+8.1****	+3.5
Mean days suspended									
Cohort 1 (1985-86/1986-87)	.6	.4	.8	2.0	.4	.1	.1	.3	.3
	(.2)	(.2)	(.2)	(.4)	(.2)	(.1)	(.1)	(.1)	(.3)
Cohort 2 (2001-02)	.6	.3	.7	2.2	.8	.2	.2	1.1	.4
	(.1)	(.1)	(.1)	(.5)	(.3)	(.1)	(.1)	(.2)	(.1)
Percentage-point change	.0	-.1	-.1	+.2	+.4	+.1	+.1	**+.8*****	+.1

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Note: Only factors for which there was a statistically significant change for at least one category of students are included in the exhibit.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Particularly large increases occurred among students with emotional disturbances (13 percentage points, $p<.05$) or other health impairments (15 percentage points, $p<.001$). These two categories of students with disabilities also were the most likely to have increases in parents' reports that they had experienced the negative consequences of poor behavior by being suspended or expelled, fired from a job, or arrested (Wagner, Cameto, et al., 2003). In contrast, no significant increases in the likelihood of being suspended occurred for students with speech, hearing, or orthopedic impairments.

For all categories except students with multiple disabilities, increases in the proportions of students having any suspensions resulted from significantly more students being suspended for 1 or 2 days (significant increases range from 3 to 13 percentage points, $p<.05$ to $p<.001$). Students with speech or orthopedic impairments show significant increases in rates of suspension for 1 or 2 days without showing increases in the likelihood of being suspended at all, suggesting that the increases in short-duration suspensions came from decreases in suspensions for more than 1 or 2 days. Additionally, among students with other health impairments, there was a significant increase of almost a full day in the average number of days suspended, bringing the average to 1.1 days per year among cohort 2 students in that category ($p<.001$).

Students with emotional disturbances were the most likely to be suspended for their behavior in both cohorts (31% and 44%, $p<.001$ compared with students with learning disabilities, for example). In contrast, fewer than 10% of students with visual or orthopedic impairments had been suspended at either point in time.

Differential Changes in School Participation across Grade Levels

There are many reasons to expect that the indicators of school participation assessed in this chapter would vary among students at different grade levels. For example, if students who drop out of school in the early high school years are those with higher absenteeism, lower grades, and/or poor social adjustment at school, one could expect school performance to be higher at the upper grade levels, where the student body has been purged of the poor performers who dropped out. Alternatively, "senioritis"—the propensity for high school seniors to miss school or relax their academic efforts in their last semester of high school, when graduation and postsecondary education outcomes are clear—could lead to particularly high absenteeism among seniors. This section describes changes in the school performance of students with disabilities that occur differentially across middle and high school grade levels.[5]

School attendance. Increases in perfect attendance are noted for students with disabilities in 7th through 11th grades (Exhibit 4-7); increases range from 14 to 16 percentage points ($p<.05$ and $p<.01$). For middle school students and high school juniors, this improvement is in contrast to increases in the percentage of students absent 4 or more days (15 and 11 percentage points, $p<.01$ and $p<.05$).

Exhibit 4-7
CHANGES IN THE ABSENTEEISM OF STUDENTS WITH DISABILITIES, BY GRADE LEVEL

	7th or 8th Grade	9th Grade	10th Grade	11th Grade	12th Grade
In a 4-week period:					
Percentage with perfect attendance					
Cohort 1 (1985-86/1986-87)	17.7	19.5	20.6	18.5	20.8
	(4.1)	(3.2)	(3.1)	(3.3)	(4.5)
Cohort 2 (2001-02)	32.0	33.0	34.8	34.2	34.2
	(5.6)	(4.5)	(4.0)	(4.3)	(5.8)
Percentage-point change	**+14.3***	**+13.5***	**+14.2****	**+15.7****	+13.4
Percentage absent 4 or more days					
Cohort 1 (1985-86/1986-87)	6.4	15.7	12.3	10.8	7.5
	(2.7)	(3.0)	(2.5)	(2.7)	(2.9)
Cohort 2 (2001-02)	21.8	18.0	17.5	22.1	29.6
	(4.9)	(3.7)	(3.2)	(3.8)	(5.6)
Percentage-point change	**+15.4****	+2.3	+5.2	**+11.3***	**+22.1*****
Mean days absent					
Cohort 1 (1985-86/1986-87)	1.4	1.9	1.7	1.7	1.5
	(.1)	(.2)	(.1)	(.1)	(.1)
Cohort 2 (2001-02)	2.4	2.5	2.4	2.3	3.0
	(.4)	(.4)	(.3)	(.3)	(.5)
Change in mean days absent	**+1.0***	+.6	**+.7***	+.6	**+1.5****

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

[5] For convenience, students in grades 7 and 8 are referred to as middle school students, and those in grades 9 and above are referred to as high school students.

High school seniors show no improvement in perfect attendance and a very large, 22-percentage-point increase in high absenteeism ($p<.001$), perhaps in part reflecting the "senioritis" noted above. In fact, in the general student population, seniors report a higher percentage of their absences due to skipping school (26%) than do 8th graders (9%, $p<.001$) or 10th graders (16%, $p<.001$; National Center for Education Statistics, 2002b). The increase in high absenteeism among seniors with disabilities resulted in an increase of 1.5 days in the average number of days absent in a 4-week period ($p<.01$), or a total of more than 13 additional days over the school year. Increases in average absenteeism days also are noted for middle school students with disabilities and 10th graders (1.0 and .7 days, $p<.05$). However, average absenteeism among cohort 2 students with disabilities was quite similar across grade levels.

Although the attendance of some students with disabilities improved between cohorts 1 and 2, middle school students with disabilities tended to be absent more than students in the general population. For example, 32% of cohort 2 7th- and 8th-grade students with disabilities had perfect attendance, compared with 45% of 8th-grade students in the general population ($p<.05$); differences between students with disabilities and the general population at other grade levels are not statistically significant (U.S. Department of Health and Human Services, 2003).

Academic performance. Grades improved for students at all grade levels (Exhibit 4-8). Specifically, the percentage of students receiving mostly As increased significantly across the grade span between cohorts 1 and 2, ranging from 13 percentage points for 9th graders ($p<.01$) to 24 percentage points for 12th graders ($p<.01$). Cohort 2 9th graders also saw a significant increase in the percentage receiving mostly Bs (17 percentage points, $p<.05$). Fewer students received mostly Cs across all grade levels, with the exception of high school juniors; significant

Exhibit 4-8
CHANGES IN THE GRADES OF STUDENTS WITH DISABILITIES, BY GRADE LEVEL

	7th or 8th Grade	9th Grade	10th Grade	11th Grade	12th Grade
Percentage receiving:					
Mostly As					
Cohort 1 (1985-86/1986-87)	2.3	1.4	2.0	3.3	7.0
	(1.6)	(.9)	(1.1)	(1.5)	(2.8)
Cohort 2 (2001-02)	18.4	14.8	17.2	17.3	31.1
	(6.1)	(4.5)	(4.2)	(4.6)	(8.0)
Percentage-point change	**+16.1***	**+13.4****	**+15.2*****	**+14.0****	**+24.1****
Mostly Bs					
Cohort 1 (1985-86/1986-87)	22.3	18.0	22.7	32.6	29.7
	(4.4)	(3.1)	(3.1)	(4.0)	(5.0)
Cohort 2 (2001-02)	34.3	34.7	32.7	32.0	38.5
	(7.5)	(6.0)	(5.2)	(5.6)	(8.4)
Percentage-point change	+12.0	**+16.7***	+10.0	-.6	+8.8
Mostly Cs					
Cohort 1 (1985-86/1986-87)	53.1	49.3	47.0	45.7	53.0
	(5.3)	(4.0)	(3.8)	(4.2)	(5.5)
Cohort 2 (2001-02)	34.8	29.8	26.6	32.2	19.4
	(7.5)	(5.7)	(4.9)	(5.6)	(6.9)
Percentage-point change	**-18.3***	**-19.5****	**-20.4*****	-13.5	**-33.6*****

Sources: NLTS school record abstract, NLTS2 Wave 1 student's school program survey, and NLTS2 general education teacher survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

decreases range from 18 to 34 percentage points ($p<.05$ to $p<.001$). Despite the fact that seniors show the largest improvement in grades over time and appear to have a pattern of somewhat higher grades at cohort 2 than other students, differences across grade levels in cohort 2 do not reach statistical significance.

School suspensions. Only high school juniors with disabilities mirror the significant increase in the likelihood of suspensions that occurred among students with disabilities as a whole (10 percentage points, $p<.05$; Exhibit 4-9). However, there were significant increases in the percentage of students suspended for 1 or 2 days among students with disabilities in 9th, 11th, and 12th grades (8 to 12 percentage points, $p<.05$ and $p<.01$). The average number of days suspended did not change significantly over time at any grade level. In neither cohort did students with disabilities at different grade levels differ in their likelihood of being suspended.

Exhibit 4-9
CHANGES IN SUSPENSIONS OF STUDENTS WITH DISABILITIES, BY GRADE LEVEL

	7th or 8th Grade	9th Grade	10th Grade	11th Grade	12th Grade
Percentage with any suspensions					
Cohort 1 (1985-86/1986-87)	17.1	13.4	13.9	8.9	7.9
	(4.3)	(2.9)	(2.9)	(2.6)	(3.1)
Cohort 2 (2001-02)	19.7	22.3	20.5	18.5	19.1
	(5.0)	(4.0)	(3.5)	(3.5)	(4.9)
Percentage-point change	+2.6	+8.9	+6.6	**+9.6***	+11.2
Percentage suspended 1 or 2 days					
Cohort 1 (1985-86/1986-87)	2.0	2.2	4.1	3.1	3.0
	(1.6)	(1.3)	(1.7)	(1.6)	(2.0)
Cohort 2 (2001-02)	8.0	11.5	10.0	11.5	14.6
	(3.4)	(3.1)	(2.6)	(2.9)	(4.4)
Percentage-point change	+6.0	**+9.3****	+5.9	**+8.4****	**+11.6***

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01.

Differential Changes in School Participation across Demographic Groups

Differential changes in school performance are found for students with disabilities who differed in their gender, household income, and racial/ethnic background.

Differential Changes in School Participation Related to Gender

School attendance. The changes in the attendance patterns for boys and girls appear to follow those described for students with disabilities overall (Exhibit 4-10). There were increases in the proportions of students having perfect attendance of 14 percentage points for boys

Exhibit 4-10
CHANGES IN THE ABSENTEEISM OF STUDENTS WITH DISABILITIES, BY GENDER

	Boys	Girls
In a 4-week period:		
Percentage with perfect attendance		
Cohort 1 (1985-86/1986-87)	19.2 (2.0)	21.2 (3.0)
Cohort 2 (2001-02)	33.6 (2.5)	34.0 (3.5)
Percentage-point change	**+14.4*** **	**+12.8** **
Percentage absent 4 or more days		
Cohort 1 (1985-86/1986-87)	11.6 (1.7)	9.6 (2.2)
Cohort 2 (2001-02)	19.8 (2.1)	24.9 (3.2)
Percentage-point change	**+8.2** **	**+15.3*** **
Mean days absent		
Cohort 1 (1985-86/1986-87)	1.7 (.1)	1.6 (.1)
Cohort 2 (2001-02)	2.4 (.2)	2.9 (.3)
Percentage-point change	**+.7** **	**+1.3*** **

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: **p<.01, *** p<.001.

(p<.001) and 13 percentage points for girls (p<.01). There also were increases in the percentages of boys and girls absent 4 or more days. Increases were more pronounced among girls (15 percentage points, p<.001) than among boys (8 percentage points, p<.01). An increase in the average number of days absent occurred for both groups (.7 days for boys, p<.01, and 1.3 days for girls, p<.001). However, there are no significant differences between genders in their overall pattern of absenteeism at either time.

Academic performance. Improvements in grades are apparent for both boys and girls (Exhibit 4-11). Both groups show increases in the percentage of students receiving mostly As (14 and 19 percentage points for boys and girls, respectively, p<.001) and decreases in the percentage receiving mostly Cs (21 percentage points, p<.001). These changes are consistent with the fact that both genders show similar increases in their likelihood of being at the appropriate grade level for their age (Wagner, Cameto, et al., 2003). Boys also show an 11-percentage-point increase in the percentage who received mostly Bs (p<.01). With fairly similar changes over time, there are no significant differences in grades between boys at girls at either time period.

Exhibit 4-11
CHANGES IN THE GRADES OF STUDENTS WITH DISABILITIES, BY GENDER

	Boys	Girls
Percentage receiving:		
Mostly As		
Cohort 1 (1985-86/1986-87)	2.3 (.8)	4.6 (1.6)
Cohort 2 (2001-02)	16.4 (2.7)	23.2 (4.3)
Percentage-point change	**+14.1*** **	**+18.6*** **
Mostly Bs		
Cohort 1 (1985-86/1986-87)	22.7 (2.2)	27.6 (3.4)
Cohort 2 (2001-02)	34.1 (3.4)	33.7 (4.9)
Percentage-point change	**+11.4** **	+6.1
Mostly Cs		
Cohort 1 (1985-86/1986-87)	49.8 (2.6)	49.6 (3.7)
Cohort 2 (2001-02)	28.8 (3.3)	28.3 (4.6)
Percentage-point change	**-21.0*** **	**-21.3*** **

Sources: NLTS school record abstract, NLTS2 Wave 1 student's school program survey, and NLTS2 general education teacher survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: **=p<.01, ***=p<.001.

Exhibit 4-12
CHANGES IN THE SUSPENSIONS OF STUDENTS WITH DISABILITIES, BY GENDER

	Boys	Girls
Percentage with any suspensions		
Cohort 1 (1985-86/1986-87)	13.5 (1.9)	9.0 (2.3)
Cohort 2 (2001-02)	24.5 (2.4)	10.4 (2.3)
Percentage-point change	**+11.0*** **	+1.4
Percentage suspended 1 or 2 days		
Cohort 1 (1985-86/1986-87)	3.1 (1.0)	2.6 (1.3)
Cohort 2 (2001-02)	13.7 (1.9)	5.8 (1.8)
Percentage-point change	**+10.6*** **	+3.2

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following level: ***=p<.001.

School suspensions. Although the average number of days suspended did not change for either gender, boys show a significant increase in the likelihood of suspensions between cohorts 1 and 2 (Exhibit 4-12). The 11-percentage-point increase in suspensions for boys is accounted for by an increase in the proportion of students receiving suspensions of 1 or 2 days (11 percentage points, p<.001). This pattern contrasts with parents' reports of very similar increases for boys and girls with disabilities in their likelihood of being fired from a job, suspended or expelled from school, or arrested (Wagner, Cameto, et al., 2003). Although no difference is evident between cohort 1 boys and girls in their likelihood of suspension, cohort 2 boys were significantly more likely to be subject to this disciplinary action at school than girls (24% vs. 10%, p<.001). However, no difference is noted between boys and girls in the likelihood that their schools had a policy of arranging alternative placements or services when they were suspended.

Differential Changes in School Participation Related to Household Income and Racial/Ethnic Background

School attendance. Students from all household income levels show significant increases in the percentage of students with perfect attendance in a 4-week period, ranging from 11 to 20 percentage points (p<.01 and p<.001; Exhibit 4-13). Reflecting the particularly large increase among students in the highest income category, these students were significantly more likely than students in the lowest income category to have perfect attendance in cohort 2 (40% vs. 29%, p<.05). In addition, there were increases in the percentage of students with relatively high absenteeism among students with disabilities in the middle and highest income groups (20

Exhibit 4-13
CHANGES IN THE ABSENTEEISM OF STUDENTS WITH DISABILITIES, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity		
	Lowest	Medium	Highest	White	African American	Hispanic
In a 4-week period:						
Percentage with perfect attendance						
Cohort 1 (1985-86/1986-87)	17.5 (3.5)	18.7 (3.3)	19.9 (2.8)	20.0 (2.0)	18.6 (3.8)	18.8 (6.6)
Cohort 2 (2001-02)	28.9 (3.6)	33.7 (4.1)	40.4 (4.2)	35.2 (2.6)	32.5 (4.5)	27.9 (5.8)
Percentage-point change	**+11.4****	**+15.0****	**+20.5*****	**+15.2*****	**+13.9***	+9.1
Percentage absent 4 or more days						
Cohort 1 (1985-86/1986-87)	17.7 (3.5)	9.1 (2.4)	6.0 (1.6)	8.6 (1.4)	15.1 (3.5)	23.7 (7.1)
Cohort 2 (2001-02)	21.7 (3.2)	29.1 (4.0)	14.0 (2.9)	20.8 (2.2)	19.8 (3.8)	27.8 (5.8)
Percentage-point change	+4.0	**+20.0*****	**+8.0****	**+12.2*****	+4.7	+4.1
Mean days absent						
Cohort 1 (1985-86/1986-87)	2.1 (.2)	1.6 (.1)	1.3 (.1)	1.4 (.1)	1.9 (.2)	2.5 (.3)
Cohort 2 (2001-02)	2.7 (.3)	3.4 (.4)	1.7 (.2)	2.3 (.2)	2.8 (.4)	3.4 (.6)
Change in mean days absent	+.6	**+1.8*****	+.4	**+.9*****	**+.9***	+.9

Source: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

and 8 percentage points, p<.001 and p<.01). Because of the large increase in the middle income group, these students were more likely to miss 4 or more days of school in a 4-week period than students with disabilities in the highest income group (29% vs. 14%, p<.01). The average absenteeism days increased only among students in medium-income households (1.8 days, p<.001).

There were no changes over time in the attendance of Hispanic students with disabilities. In contrast, the percentage of students with perfect attendance in a 4-week period increased for both white and African-American students (15 and 14 percentage points, p<.001 and p<.05). Increases in high absenteeism were associated only with white students (12 percentage points, p<.001), which eliminated the significant gap in high absenteeism between them and Hispanic students with disabilities seen in cohort 1 (9% vs. 24%, p<.05). The average number of days absent increased by almost 1 day for white and African-American students (p<.001 and p<.05). As with high absenteeism, the increase for white students with disabilities closed the gap that existed between cohort 1 white youth and both African-American and Hispanic students (1.4 vs. 1.9 and 2.5, p<.05 and p<.001). Despite differences in the degree of change in attendance over time for students with disabilities from different racial/ethnic backgrounds, differences in their absenteeism at cohort 2 are not significant.

Academic performance. Cohort 2 students with disabilities from households at all income levels received more As than their cohort 1 peers (Exhibit 4-14), with increases ranging from 11

to 23 percentage points, p<.05 to p<.001). Students from the highest income category show the largest increase, resulting in their having a significantly higher likelihood of receiving mostly As than peers from the lowest income group (26% vs. 13%, p<.05). Students in the highest income group also are the only students to show an increase in the likelihood of receiving mostly Bs (14 percentage points, p<.05). Grade improvements for students from both the middle and highest income groups resulted from significant decreases in the likelihood that they received mostly Cs (22 and 33 percentage points, p<.01 and p<.001).

Exhibit 4-14
CHANGES IN GRADES FOR STUDENTS WITH DISABILITIES, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity		
	Lowest	Medium	Highest	White	African American	Hispanic
Percentage receiving:						
Mostly As						
Cohort 1 (1985-86/1986-87)	1.7	4.3	2.6	3.4	1.6	4.3
	(1.2)	(1.7)	(1.1)	(.9)	(1.2)	(3.5)
Cohort 2 (2001-02)	13.1	16.6	25.9	19.6	18.1	15.7
	(3.9)	(4.5)	(4.5)	(2.8)	(5.6)	(6.8)
Percentage-point change	**+11.4****	**+12.3***	**+23.3*****	**+16.2*****	**+16.5****	+11.4
Mostly Bs						
Cohort 1 (1985-86/1986-87)	19.4	27.5	24.8	27.1	14.8	26.3
	(3.7)	(3.8)	(3.0)	(2.3)	(3.5)	(7.6)
Cohort 2 (2001-02)	28.6	34.7	38.6	34.9	31.0	28.6
	(5.3)	(5.7)	(5.1)	(3.3)	(6.7)	(8.5)
Percentage-point change	+9.2	+7.2	**+13.8***	+7.8	**+16.2***	+2.3
Mostly Cs						
Cohort 1 (1985-86/1986-87)	48.8	49.0	56.0	50.5	50.7	40.2
	(4.7)	(4.3)	(3.5)	(2.6)	(5.0)	(8.5)
Cohort 2 (2001-02)	34.5	26.9	23.1	27.1	26.0	40.9
	(5.6)	(5.3)	(4.4)	(3.1)	(6.4)	(9.3)
Percentage-point change	-14.3	**-22.1****	**-32.9*****	**-23.4*****	**-24.7****	+.7

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

Hispanic students with disabilities did not share in the improvements in grades of students with disabilities as a whole, nor did they become more likely over time to be at the appropriate grade level for their age (Wagner, Cameto et al., 2003). However, changes in grades are noted for white and African-American students, with changes being fairly similar for the two groups. Changes in the likelihood of receiving both mostly As (16-percentage-point increases, p<.001 and p<.01) and mostly Cs are quite similar (decreases of 23 and 25 percentage points, p<.001 and p<.01). In fact, the percentages of both white and African-American students who received mostly Cs dropped by about half over time. However, only African-American students with disabilities show a significant increase in the likelihood of receiving mostly Bs (16 percentage points, p<.05), which eliminated the gap that existed between cohort 1 African-American and white students in the likelihood of receiving such grades (15% vs. 27%, p<.05). These changes in academic performance over time resulted in there being no statistically significant differences across cohort

2 racial/ethnic groups in grades received, which is consistent with their similar likelihood of being at the appropriate grade level for their age (Wagner, Cameto, et al., 2003).

School suspension. The greater likelihood of short-term suspensions that was found for students with disabilities as a whole occurred across all income groups, ranging from 6 to 10 percentage points ($p<.05$ and $p<.01$; Exhibit 4-15). However, only among students with disabilities from the lowest-income households did this change result in a significant increase in the likelihood of being suspended at all (13 percentage points, $p<.01$). With this increase, cohort 2 students with disabilities from the lowest income group were significantly more likely than those in the highest income group to be suspended from school (25% vs. 14%, $p<.05$). However, cohort 2 parents' reports of whether their adolescent children with disabilities had been fired from a job, suspended or expelled from school, or arrested show no differences for students from households with different levels of income (Wagner, Cameto, et al., 2003).

Regarding differences in school suspension across racial/ethnic groups, Hispanic students with disabilities show no significant changes over time, nor were their parents more likely to report that they had experienced negative consequences for behavior at school, on the job, or in the community (Wagner, Cameto, et al., 2003). In contrast, both white and African-American students with disabilities show significant increases in the likelihood of being suspended 1 or 2 days, the increase being more than twice as large for African-American students (14 percentage points, $p<.001$) as for white students (6 percentage points, $p<.001$). Because of the sizable increase for African-American students, cohort 2 students with disabilities in that category were much more likely than their white peers to have had short-term suspensions (17% vs. 9%, $p<.05$). Cohort 2 African Americans also were more likely than white students with disabilities to have been suspended at all (29% vs. 18%, $p<.05$), even though white students show the only significant increase in the likelihood of any suspensions over time (9 percentage points, $p<.001$), and they show the only increase in parents reporting that they had been fired from a job, suspended or expelled from school, or arrested (Wagner, Cameto, et al., 2003).

Exhibit 4-15
CHANGES IN SUSPENSIONS FOR STUDENTS WITH DISABILITIES, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity		
	Lowest	Medium	Highest	White	African American	Hispanic
Percentage with any suspensions						
Cohort 1 (1985-86/1986-87)	12.3 (3.3)	14.3 (3.1)	8.1 (2.0)	9.1 (1.6)	18.5 (4.3)	20.7 (7.1)
Cohort 2 (2001-02)	24.9 (3.5)	17.8 (3.4)	14.4 (2.9)	17.8 (2.1)	28.7 (4.5)	16.7 (5.1)
Percentage-point change	**+12.6****	+3.5	+6.3	**+8.7*****	+10.2	+4.0
Percentage suspended 1 or 2 days						
Cohort 1 (1985-86/1986-87)	3.9 (2.0)	1.9 (1.2)	3.1 (1.3)	2.6 (.9)	2.9 (1.9)	6.2 (4.2)
Cohort 2 (2001-02)	13.7 (2.8)	10.1 (2.7)	9.3 (2.4)	8.9 (1.5)	17.4 (3.7)	13.1 (4.6)
Percentage-point change	**+9.8****	**+8.2****	**+6.2***	**+6.3*****	**+14.5*****	+6.9

Sources: NLTS school record abstract and NLTS2 Wave 1 student's school program survey.

Standard errors are in parentheses.

Statistically significant difference in a two-tailed test at the following levels: *=p<.05, **=p<.01, ***=p<.001.

All income and racial/ethnic groups show increases of similar magnitude in the likelihood of attending schools with policies of arranging alternative placements and services for students with disabilities who were suspended from school.

Summary

The changes in the school participation of students with disabilities present a mixed picture of their achievements. For example, changes in student attendance are both positive and negative. There was an overall increase in the percentage of students who had perfect attendance in a 4-week period. However, this positive trend is offset by an increase in the percentage of students who were absent 4 or more days in a 4-week period, or more than 7 weeks in the school year. This change resulted in an increase of about 8 days in the average number of days absent during the school year for students with disabilities. A similar "good news, bad news" picture is apparent regarding school suspensions. The average number of days students had been suspended from school did not change over time. However, more students with disabilities experienced suspension as a consequence of inappropriate behavior at school; one-fifth of cohort 2 students with disabilities had been suspended during their school years. These measures of absenteeism and suspensions are particularly troubling for youth with emotional disturbances; one-fourth of these youth in cohort 2 missed an average of more than 7 weeks of school per year, and their suspension rate was twice to four times as high as those of youth in other disability categories.

Improvements in grades were more consistently positive. There was an overall increase in the percentage of students receiving As and Bs, a change that came largely from a reduction in the percentage of students who received mostly Cs. However, one-fifth of cohort 2 students with disabilities earned below-average grades of mostly Ds or Fs.

These patterns of change were generally stable across disability categories and demographic groups, although the exceptions to this similarity are notable. For example, there was no improvement in grades for students with mental retardation or other health impairments. Neither students with hearing impairments nor girls with disabilities show the increase in the likelihood of suspensions that occurred for males and students in other disability categories. High school seniors with disabilities are the only students not to show an increase in perfect attendance. The smallest improvements in grades and the largest increase in the likelihood of being suspended from school occurred among students with disabilities from the lowest-income households. Finally, Hispanic students show none of the changes in school participation that are apparent for white and African-American students with disabilities.

Comparisons between high school transcript data collected in subsequent waves of NLTS2 with those collected in wave 2 of NLTS will permit a more detailed analysis of school attendance, academic performance, and school suspensions.

5. CLEAR BUT UNEVEN PROGRESS FOR STUDENTS WITH DISABILITIES

Youth with Disabilities: A Changing Population, an earlier comparison of information reported by parents of NLTS and NLTS2 students (Wagner, Cameto, et al., 2003[1]), documented many changes over a period of about a decade and a half in the characteristics of youth with disabilities, their households, and some aspects of their experiences. Summarizing those changes, that report raised the question "Have they been for the better?" and concluded that "In many respects, the answer to that question is 'yes,' but that answer applies to some youth more than to others. Findings also point to several challenges remaining for youth with disabilities, their families, and the schools that serve them" (Wagner, Cameto, et al., 2003, p. 6-1). The same question can be raised in response to the changes in the schools, school programs, and school participation of secondary school students with disabilities that have been reported by school staff and described in this document. And in many respects, the answer to the question is the same. Many of the changes documented in the preceding chapters are good news indeed for students with disabilities, their families, and their schools. However, not all students with disabilities have shared equally in those positive changes, and some changes suggest potential cause for concern regarding their impacts on some students with disabilities. Both the positive changes and potential concerns are summarized in the following sections.

A "Good News" Story

A variety of positive changes in the schools, school programs, and school participation of students with disabilities tell what is in many respects a "good news story" regarding the increased access of students with disabilities to general education classrooms, their increased participation in core academic courses, and their increased ability to earn grades that indicate they are meeting academic performance expectations at school.

Access to General Education Classrooms with Supports

As mentioned elsewhere in this report, a variety of changes in policy and practice regarding students with disabilities, many embedded in the Individuals with Disabilities Act Amendments of 1997 (IDEA '97), have had the overriding purpose of increasing the participation of students with disabilities in general education classrooms to the extent appropriate for their individual needs. These efforts were intended to improve access to the general education curriculum for students with disabilities, promote higher academic standards, and provide opportunities for social integration with nondisabled students. Further, supports are to be provided to students with disabilities and their teachers to enable the students to meet those higher standards and succeed in general education classrooms. This report provides evidence of progress in expanding participation in general education classrooms, with supports, for many students with disabilities.

Relative to their counterparts in the mid-1980s, cohort 2 students with disabilities demonstrate a trend away from enrollment in special schools that serve only that population and toward attendance at regular secondary schools. Over time, this shift cut in half the percentage of students

[1] The full report is available at http://www.nlts2.org/reports/changepop_report.html

with disabilities who were attending special schools. The school programs of cohort 2 students with disabilities also demonstrate less involvement in special education classes and greater participation in general education academic classes. In fact, the percentage of students with disabilities who were spending no part of their school day in special education classes tripled over time, so that 30% of cohort 2 students with disabilities were receiving instruction entirely in general education classes. And there is some evidence that students may be accessing the general education curriculum in greater numbers. General education classes taken by students with disabilities increasingly involved academic subjects, including mathematics, science, and social studies. In the spring semester of the 2001-02 school year, 7 in 10 secondary school students with disabilities were taking at least one academic course in a general education class.

This clear pattern of increasing participation by students with disabilities in general education classrooms might not be the good news it appears to be on the surface if students and their general education teachers were expected to fend for themselves in meeting the performance demands of general education classes. However, there is evidence that several kinds of support for both teachers and students with disabilities in general education classes became more common. Many more cohort 2 students with disabilities than their peers in cohort 1 were going to schools that reported a policy of providing general education teachers who had students with disabilities in their classes with in-service training on the needs of such students, a classroom aide for the teacher or for individual students with a disability, a smaller class size, or special equipment or materials to use with students. Further, a variety of related services for students also became more common, including mental health, social work, and health services; assistive devices and adaptations; and orientation and mobility training. These findings suggest that students with disabilities and their teachers are increasingly being provided the supports that may help students participate and succeed in their general education classes.

Participation in Core Academic Courses

Findings from NLTS demonstrated that few students with disabilities were attending college after high school (Blackorby & Wagner, 1996). In part, the reason was that their high school course schedules did not include the number and types of academic courses needed to prepare them for postsecondary education (Newman & Cameto, 1993). However, significant changes have occurred in the course taking of students with disabilities since that time. Cohort 2 students with disabilities were much more likely than cohort 1 students to be taking the kinds of academic courses that would prepare them for college, including substantial increases in mathematics, science, social studies, and foreign language enrollments.

As mentioned above, the academic courses of cohort 2 students with disabilities were much more likely to be in general education classes than was true for their cohort 1 counterparts. NLTS2 findings also demonstrate that the vast majority of those general education classes were performing at grade level (Wagner, Marder, Cameto, et al, 2003); 82% of students with disabilities who were taking general education academic classes in the spring of the 2001-02 school year were reported by their teachers to be in classes where the majority of students were performing at grade level, whereas only 16% were tracked into general education academic classes whose students performed primarily below grade level. In addition, differential changes in course taking among boys and girls with disabilities eliminated the differences in their high school course schedules that were evident in the mid-1980s; cohort 2 boys and girls were equally likely to enroll in the same kinds of

academic and nonacademic courses. Almost half of students with disabilities represented in NLTS2 were reported to have as their primary transition goal attending a 2- or 4-year college (Cameto, Levine, et al., 2004, and greater numbers of students with disabilities, regardless of gender, had secondary school programs that provided a foundation to achieve that goal.

Academic Performance Improvements

Comparisons between students with disabilities represented in NLTS and NLTS2 show substantial improvements in the grades they received. A shift from students' receiving mostly Cs to receiving mostly As or Bs resulted in receipt of above-average grades by more than half of cohort 2 students with disabilities. These improvements in grades are consistent with results of an earlier NLTS/NLTS2 comparison, which showed that cohort 2 students with disabilities were much more likely than those in cohort 1 to have met the academic requirements of each succeeding grade level and, therefore, to be at the appropriate grade level for their age (Wagner, Cameto, et al., 2003). Grade improvements among students with disabilities also are consistent with a trend in the general population toward higher grades (Koretz & Berends, 2001).

These grade improvements suggest that increases in the access of students with disabilities to both general education classrooms and potentially more rigorous curricula in core academic subjects apparently did not jeopardize their ability to meet the performance expectations of their teachers, as indicated by students' grades. The NLTS2 survey of teachers of students' general education academic classes shows that 97% of students with disabilities were expected to keep up in those classes, and about three-fourths of them actually did so (Newman, Marder, et al., 2003). Performance was stronger in general education vocational classes; 95% were expected to keep up with other students in those classes, and 87% did so (Cameto & Wagner, 2003).

Increased School and Community Resources

The "suburbanization" of communities all over the country, including those in which cohort 2 students with disabilities attended school, may have contributed to access for more of them to a wider array of options for success both during secondary school and in their postschool years. More cohort 2 than cohort 1 students with disabilities were going to school in communities that had choices for secondary schooling, including alternative or continuation schools, vocational or technical schools, and magnet schools. Supports for adult independence also were more common for cohort 2 students, including independent living centers, group homes, and work facilities for adults with disabilities. Advocacy and support groups for persons with disabilities, too, were more likely to be part of the mix of resources in cohort 2 students' communities. The growing ethnic and language diversity of the American student population, including students with disabilities, also resulted in an increased likelihood that the schools they attended had programs to support students whose first language was not English.

Potential Concerns

Despite this pattern of positive changes in the schools, school programs, and school participation of students with disabilities, other findings suggest areas of potential concern regarding the very issues described above, as well as others. In addition, it is clear that positive changes have not occurred equally among youth who differ in their primary disability, household income, or racial/ethnic background.

Increased Prevalence of Self-Contained Classrooms

Alongside the good news that many students with disabilities were participating more in general education classes is the knowledge that schools attended by cohort 2 students with disabilities were much more likely to have self-contained special education classrooms as a placement option than had been true for cohort 1 students. This increase in self-contained settings in regular secondary schools parallels a decrease in students with disabilities attending special schools that served only that population. Thus, the decision to create self-contained classrooms in regular secondary schools may have been made in response to an influx of students with disabilities who otherwise would have gone to special schools and who were determined to need the kinds of instruction and supports that are possible in self-contained special education classrooms. Hopefully, the presence of such placements in regular secondary schools does not create an inherent demand to keep them full even when the needs of the students with disabilities in the school in any given year do not warrant self-contained placements.

Do Academics Exclude Other Course Choices?

Although many students with disabilities have a goal of college attendance after high school, and they are increasingly likely to have the academic preparation to enable them to achieve that goal, more than half of students with disabilities represented in NLTS2 had a primary transition goal of competitive employment, 40% had a primary goal of postsecondary vocational training, and the primary transition goal for one in five students with disabilities was maximizing functional independence (Cameto, Levine, et al., 2004). A school program that has a heavy emphasis on academic course taking may not be the most effective program to help students, with or without disabilities, meet these kinds of goals.

Vocational course taking, which can contribute significantly to increasing the odds of positive postsecondary outcomes (Wagner, Blackorby, et al., 1993), declined over time, even though it was more likely to be reported as a "very appropriate" placement for individual students with disabilities by general vocational education teachers than by general education academic teachers (Cameto & Wagner, 2003). When students with disabilities did take vocational education, it increasingly was the purview of special education rather than general education. Although life skills or study skills instruction increased, it too was provided primarily in special education settings. An overriding emphasis on academics, to the exclusion of vocational and other kinds of nonacademic instruction, could be mismatched to the goals of some students with disabilities.

Improved Academic Performance Still Leaves Many Behind

The improvements in academic performance noted for students with disabilities, as indicated by improved grades and students' progressing at the typical pace through the grade levels, were not experienced by all students with disabilities. The grades earned by one in five cohort 2 students were mostly Ds or Fs, and almost half were not at the typical grade level for their age. About one-fourth of students with disabilities who took general education academic classes and who were expected to keep up in them failed to do so, according to their teachers (Newman, Marder, et al., 2003). Also worrisome is the fact that, on average, students with disabilities represented in NLTS2 were reported by their teachers to be 3.6 years behind grade

level in their reading and mathematics abilities, with 26% being five or more grade levels behind (Blackorby, Chorost, et al., 2003).[2] Thus, although they may have received better grades, achievement gaps of this size raise questions about students' abilities to tackle the complex academic content called for by increasingly rigorous state standards, meet high-stakes testing requirements for graduation, and be successful in postsecondary education.

Increases in School Absenteeism and Suspension

Improvements in the academic performance of students with disabilities do not appear to extend to their engagement in school, as indicated by absenteeism, or to their social adjustment at school, as indicated by suspensions. Compared with their cohort 1 counterparts, cohort 2 students with disabilities missed more school—an average of 8 more days over the school year, bringing average absenteeism to more than 4 weeks in the school year. Yet cohort 2 students with disabilities were not more likely than students in the general population to be absent, although higher absenteeism was noted for cohort 1 students with disabilities than the general population of students at that time (Wagner, 1991a). Nonetheless, missing an average of 23 days of school in a given year may pose a significant obstacle to academic success for students who already experience learning challenges due to disability.

Further, cohort 2 students with disabilities show an 8-percentage-point increase over those in cohort 1 in having been suspended during the year, with one in five being subject to that disciplinary action. Students with emotional disturbances were particularly likely to have experienced these difficulties; they were the most likely to have high absenteeism and were more than twice as likely as any other group of students to have been suspended in the current school year. Increases in suspensions are potentially cause for concern because disciplinary actions at school have been shown to correlate highly with poor social skills, poor classroom social behaviors, a higher likelihood of students' engaging in bullying, and a higher probability of arrest among students with disabilities (Marder, Wagner, et al., 2003).

It is still unclear whether the increasing difficulties students with disabilities appeared to have with attendance and suspensions related to changes in the school environment. "Zero tolerance" policies in schools could have had particularly significant impacts on students whose disabilities have behavioral implications. In addition, cohort 2 students with disabilities were going to high schools that were larger, on average, than those attended by students in the general population, with the potential challenges inherent in those schools. Also, the stress that may have accompanied the increased academic emphasis in students' school programs noted above may have been associated with behavioral problems for some students. Whatever role the school environment may have played in students' behavior, school policies supported the continuation of services for students with disabilities who are suspended, as intended by law. Virtually all cohort 2 students with disabilities were going to schools that were reported to arrange for

[2] NLTS2 data permit the calculation of a measure of 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 levels in that same year, the difference indicates how far ahead of or behind their actual grade levels they function. This measure of reading and mathematics ability should not be confused with the measure of whether students progressed through the grade levels at a typical pace and, therefore, were at the typical grade level for their age.

alternative placements and continuation of services for students with disabilities who were suspended or expelled from school.

The Potential Challenges of Transitioning from Middle to High School

Comparisons between students with disabilities represented in NLTS and NLTS2 suggest that the transition from middle to high school increasingly entailed potential challenges. As noted previously, the environments of very large schools can pose impediments to students' finding their "niche," establishing close, positive relationships with adults and peers, and attracting the individual attention of school staff that they may need to succeed. The significant increase in the average size of schools attended by students with disabilities occurred entirely among high schools. Thus, cohort 2 students with disabilities transitioned from middle schools with enrollments of about 750 students to high schools that averaged more than 1,300 students. Further, among cohort 1 students with disabilities, transitioning to high school was accompanied by a decrease in academic course taking relative to middle school and a growing emphasis on vocational education. Changes over time resulted in increased academic course taking and decreased vocational education course taking in the early years of high school so that there was no overall decline in academic course taking until students' senior year. And 9th grade is the year in which the greatest shift to general education classes for academic courses is noted, raising the likelihood that students with disabilities would take general education academic classes in their first year in high school. An awareness of the potential need for support on the part of students with disabilities in adjusting to the expectations and environment of high school could help ease the transition for some students with disabilities.

Unequal Benefits

Neither the benefits to students with disabilities nor the potential challenges that have been described above accrued to all groups of youth equally. Students who differ in their primary disability category, grade level, gender, household income, and race/ethnicity show at least some of these changes to different degrees, as noted below.

Differential changes over time across disability categories. As with so many other aspects of their lives, students with different primary disability classifications show substantial differences in some changes in their schools, school programs, and school performance. Students with multiple disabilities, including deaf-blindness, and, to a lesser extent, those with mental retardation show wider-ranging changes in their school experiences than most other groups of students. Most of the changes served to align their school experiences more closely with those of their peers, although cohort 2 students with multiple disabilities often still found themselves at the extreme end of the variation across disability categories.

For example, students with multiple disabilities or mental retardation are two of only three categories of students who show a significant increase in attendance at regular secondary schools and a corresponding decline in attendance at special schools that serve only students with disabilities, with those changes being most extreme for students with multiple disabilities. Students with multiple disabilities also are the only group to register significant increases in taking any academic courses and in taking courses in general education classes, particularly language arts, fine arts, and physical education courses. These changes closed some of the gap

between students with multiple disabilities and other students in taking academic and general education classes, but they continued to be less likely to do so than others.

Students with multiple disabilities or mental retardation are the only two categories to show increases in vocational education course taking, counter to the declines seen among some other groups. They also account almost entirely for the increase in students with disabilities taking courses in vocational centers. And they are two of only three groups to show increases in life skills instruction, entirely within special education classes.

The changes in school participation that correspond to alterations in schools and school programs are somewhat more positive for students with multiple disabilities than for those with mental retardation. Students with multiple disabilities show some improvement in grades over time, but that improvement was not shared by students with mental retardation. In contrast, students with mental retardation show an increase in their overall absenteeism that did not accrue to students with multiple disabilities.

Students with other health impairments stand out in sharp contrast to the students described above and, indeed, to students in most other categories. Students with disabilities as a whole show an increase in the average size of the schools they attended, as well as increases in the percentage of the student body who were students of color and those living in poverty. These changes may be related to a substantial shift from attending schools in rural areas to attending schools in suburban communities. In contrast, students with other health impairments show just the opposite pattern of change. Cohort 2 students with other health impairments attended smaller schools that had a larger percentage of white students and a smaller percentage of low-income students than the schools of their cohort 1 counterparts. They also show the largest suburbanization of their schools, but they are the only ones to have that increased suburbanization come from a decline in urban school attendance as well as rural school attendance.

Changes in the schools attended by students with other health impairments and the communities surrounding them are consistent with changes in the characteristics of those students themselves; they, along with students with speech impairments, are the only disability group to have an increased probability of being white, and they show the largest decrease in the probability that students in that category were living in poverty (Wagner, Cameto, et al., 2003). These changes among students with other health impairments may have resulted to a substantial degree because of changes in the nature of the disabilities included in that category. Although autism has become a separate disability category for special education purposes, at the time of NLTS, students with autism generally were included among those with other health impairments and, therefore, are included in that category for purposes of the comparisons documented in this report. A dramatic increase in the incidence and/or diagnosis of autism changed the demographic composition of students who, in the analyses reported here, are included in the other health impairment category; autism is more likely to occur among males and those from higher-income households (Wagner, Marder, & Cardoso, 2003). Similar changes in the demographics of this category resulted from a marked increase in identifying students with attention deficit/hyperactivity disorder (ADHD), which also is more likely to occur among males and students from higher-income households (Wagner, Marder, & Cardoso, 2003). Students who receive special education and whose primary disability is ADHD generally are included in the other health impairment category.

The change in the disability composition of the other health impairment category may help explain the changes in these students' social adjustment at school. They show the largest increase in school suspensions and the only increase in the average number of days suspended. Multivariate analyses of the social adjustment of youth represented in NLTS2 show that having ADHD is associated with a much higher likelihood of being subject to disciplinary actions at school, independent of other differences between youth in their disabilities, functioning, demographics, and schools programs (Marder, Wagner, et al., 2003).

Economic and cultural variations in changes over time. Students with disabilities who differ in their household incomes and in their racial/ethnic backgrounds also differ in the ways and degrees to which they show changes in schools, school programs, and school participation. For example, cohort 2 white students and those in the highest income group show the greatest changes in factors that may contribute to better odds of participating in postsecondary education. White students with disabilities show the most widespread increases in academic course taking, and upper-income students register the largest increase in taking a foreign language, often a required course for college admission. Consistent with an increased academic focus in their course schedules, these groups are the only ones to show a significant decline in vocational course taking. The largest improvement in grades also occurred among white and upper-income students with disabilities. Increases in participation in general education classes also occurred most noticeably among white and upper-income students with disabilities; they are the only groups to show significant declines in attendance at special schools and increases in attendance at regular secondary schools, and they also show the largest decreases in participation in special education courses. Moreover, increases in community resources are most pronounced among students in these two groups.

In contrast, students of color with disabilities show many fewer changes in their school experiences. For example, Hispanic students with disabilities are the only group not to show an improvement in their grades. However, neither do they show an increase in absenteeism or suspensions, which is evident among white and African-American students with disabilities. And despite having much greater suburbanization of the communities in which they were attending school, African-American and Hispanic students with disabilities, as well as those from the lowest-income households, show very few increases in resources in those communities.

Looking Forward

This report has examined the progress that has been achieved in several aspects of the schools, school programs, and school participation of secondary school students with disabilities and potential challenges that remain. These findings raise the question of how the postschool outcomes of students with disabilities might be affected by the evolving nature of their secondary school experiences. Comparisons of findings from the subsequent waves of data collection of NLTS2 with wave 2 of NLTS will address this question by using transcript data to examine the course-taking patterns of students with disabilities over their full high school careers and their achievements in the early years after high school.

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APPENDIX A

NLTS AND NLTS2 SAMPLING, DATA COLLECTION, AND ANALYSIS PROCEDURES: WAVE 1 SCHOOL DATA

Appendix A
NLTS AND NLTS2 SAMPLING, DATA COLLECTION, AND ANALYSIS PROCEDURES: WAVE 1 SCHOOL DATA

This appendix describes several aspects of the NLTS and NLTS2 methods relevant to the data provided by schools that are reported in this document and to comparisons between the studies, including:

- Sampling of local education agencies (LEAs), schools, and students
- School data collection procedures and response rates
- Weighting of the data
- Analytic adjustments to increase the comparability of the study samples
- Estimation and use of standard errors
- Unweighted and weighted sample sizes
- Calculation of statistical significance
- Measurement issues.

Overview of the NLTS and NLTS2 Samples

The samples for both studies were constructed in two stages. A stratified random sample of LEAs was selected from the universe of operating LEAs that served students receiving special education in at least one grade from 7th through 12th grades in the 1983-84 and 1999-2000 school years. These LEAs and all state-supported special schools that served primarily students with hearing and vision impairments and multiple disabilities were invited to participate in the study. Targets of recruiting 400 and 497 participating LEAs were set for the two studies, respectively, and as many special schools as possible. From these would be selected target student samples of about 14,000 (NLTS) and 12,000 students (NLTS2). Approximately three-fourths of the target number of LEAs was reached in NLTS and 101% in NLTS2.

For both studies, the roster of all students receiving special education from each participating LEA[1] and special school was stratified by disability category (11 in use in 1987 and 12 in 2000) and age. Students then were selected randomly from each disability category and age group. Sampling fractions were calculated that would produce enough students in each category so that, in the final year of each study, findings would generalize to most categories individually with an acceptable level of precision, accounting for attrition and for response rates to the parent/youth interview. A total of 10,369 and 11,276 students were selected and eligible to participate in the NLTS and NLTS2 parent interview/surveys, respectively.

Details of the LEA and student samples are provided below.

[1] LEAs were instructed to include on the roster any student for which they were administratively responsible, even if the student was not educated within the LEA (e.g., attended school sponsored by an education cooperative or was sent by the LEA to a private school). Despite these instructions, some LEAs may have underreported students served outside the LEA.

The LEA Samples

Defining the Universe of LEAs

The NLTS and NLTS2 samples include only LEAs that had teachers, students, administrators, and operating schools—that is, "operating LEAs." They exclude such units as supervisory unions; Bureau of Indian Affairs schools; public and private agencies, such as correctional facilities; LEAs from U.S. territories; and LEAs with 10 or fewer students in the NLTS2 age range, which would be unlikely to have students with disabilities.

The public school universe data file maintained by Quality Education Data (QED) for 1998 was used to construct the NLTS2 sampling frame because it had more recent information than the alternative list maintained by the National Center for Education Statistics (NCES). For NLTS, a combination of QED and NCES data was used for the 1983 and 1984 school years, respectively. In NLTS, a sample of 1,600 LEAs was surveyed by telephone to collect data on LEAs for sample and bias estimation purposes. (Details of the NLTS Wave 1 sample can be found in Javitz & Wagner, 1990.) Correcting for errors and duplications resulted in a master list of 13,180 (NLTS) and 12,435 (NLTS2) LEAs that met the selection criteria for the two studies. These comprised the LEA sampling frames.

Stratification

The LEA samples were stratified to increase the precision of estimates, to ensure that low-frequency types of LEAs (e.g., large urban districts) were adequately represented in the samples, to improve comparisons with the findings of other research, and to make the studies responsive to concerns voiced in policy debate (e.g., differential effects of federal policies in particular regions, LEAs of different sizes). Three stratifying variables were used:

Region. This variable captures essential political differences, as well as subtle differences in the organization of schools, the economic conditions under which they operate, and the character of public concerns. The regional classification that was used by the U.S. Department of Commerce, the U.S. Bureau of Economic Analysis, and the National Assessment of Educational Progress was selected (categories are Northeast, Southeast, Midwest, and West).

LEA size (student enrollment). LEAs vary considerably by size, the most useful available measure of which is student enrollment. A host of organizational and contextual variables are associated with size, and they exert considerable potential influence over the operations and effects of special education and related programs. In addition, total enrollment serves as an initial proxy for the number of students receiving special education in an LEA. The QED database provides enrollment data from which LEAs were sorted into the following categories:[2]

NLTS

- **Huge** (enrollment of 50,000 or more).
- **Very large** (enrollment of 25,000 to 49,999).
- **Large (**enrollment of 10,000 to 24,999).

[2] NLTS size strata were determined by logical dividing points using multiples of 500 students. NLTS2 strata are quartiles.

- **Medium (**enrollment of 2,500 to 9,999).
- **Small** (enrollment of 500 to 2,499).
- **Very small** (enrollment less than 500).

NLTS2

- **Very large** (estimated[3] enrollment greater than 14,931 in grades 7 through 12).
- **Large** (estimated enrollment from 4,661 to 14,931 in grades 7 through 12).
- **Medium** (estimated enrollment from 1,568 to 4,660 in grades 7 through 12).
- **Small** (estimated enrollment from 11 to 1,567 in grades 7 through 12).

LEA/community wealth. As a measure of district wealth, the Orshansky index (the proportion of the student population living below the federal definition of poverty, Employment Policies Institute, 2002) is a well-accepted measure. The distribution of Orshansky index scores was organized into four categories of LEA/community wealth, as follows:[4]

NLTS

- **High** (0 to 4% disadvantaged youth).
- **Medium** (5% to 9% disadvantaged youth).
- **Low** (10% to 19% disadvantaged youth).
- **Very low** (20% or more disadvantaged youth).

NLTS2

- **High** (0% to 13% disadvantaged youth).
- **Medium** (14% to 24% disadvantaged youth).
- **Low** (25% to 43% disadvantaged youth).
- **Very low** (43% or more disadvantaged youth).

The three variables generated 96- and 64-cell grids for the two studies, into which the universes of LEAs were arrayed.

LEA Sample Size

On the basis of an analysis of LEAs' estimated enrollment across LEA size, and estimated sampling fractions for each disability category, targets of 400 and 497 LEAs (and as many state-sponsored special schools as would participate) were considered sufficient to generate the student samples needed for the two studies (Exhibit A-1). Taking into account expectations regarding the rate at which LEAs would refuse to participate (which experience in the intervening years suggests would be dramatically higher in 2000 than in 1987), samples of 628 and 3,635 LEAs were invited to participate in the two studies, respectively. A total of 303 and

[3] Enrollment in grades 7 through 12 was estimated by dividing the total enrollment in all grade levels served by an LEA by the number of grade levels to estimate an enrollment per grade level. This value was then multiplied by 6 to estimate the enrollment in grades 7 through 12.

[4] NLTS wealth strata were defined by logical divisions, with strata being multiples of 5 percentage points. NLTS2 strata are quartiles.

501 LEAs provided students for the two study samples—76% and 101% of the target numbers needed and 48% and 14% of those invited. Analyses of the region, size, and wealth of the LEA sample, both weighted and unweighted, confirmed that that the weighted LEA sample closely resembled the LEA universe with respect to those variables. However, in addition to ensuring that the LEA sample matched the universe of LEAs on variables used in sampling, it was important to ascertain whether the stratified random sampling approach resulted in skewed distributions on relevant variables not included in the stratification scheme. Thus, additional extensive analyses were conducted on the LEA sample of both studies.

Exhibit A-1
FIRST STAGE SAMPLE SIZES

	NLTS	NLTS2
Target LEA sample sought	400	497
Sample invited to participate		
LEAs	628	3,635
Special schools	84	77
TOTAL	712	3,712
Sample participating		
LEAs	303	501
Special schools	22	37
TOTAL	325	538
Percentage of invited		
LEAs	48%	14%
Special schools	26%	48%
TOTAL	46%	14%
Percentage of LEA target	**76%**	**101%**

NLTS analyses involved comparing the 303 participating LEAs with a sample of 1,600 LEAs randomly selected from the universe of LEAs and contacted in a brief telephone survey. The only significant or meaningful difference found between the NLTS sample and the larger survey sample was that NLTS underrepresented students in LEAs that served grades kindergarten through eighth grade. It was hypothesized at the time that K-8 districts may not have perceived themselves to be secondary districts and refused to participate at higher rates because only their seventh and eighth grade students would have met the sample criteria. No variables, beyond those used to stratify the sample, were used in constructing weights at the LEA level.

NLTS2 analyses involved several stages. The first involved selecting three variables from the QED database on which to compare the "fit" between the first-stage sample and the population: the LEA's racial/ethnic distribution of students, the proportion who attended college, and the urban/rural status of the LEA. This analysis revealed that the sample of LEAs somewhat underrepresented African American students and college-bound students, and overrepresented Hispanic students and LEAs in rural areas. Thus, in addition to accounting for stratification variables, LEA weights were calculated to achieve a distribution on the urbanicity and racial/ethnic distributions of students who matched the universe.

To determine whether the resulting weights, when applied to the participating NLTS2 LEAs, accurately represented the universe of LEAs serving the specified grade levels, data collected from the universe of LEAs by the U.S. Department of Education's Office of Civil Rights (OCR) and additional items from QED were compared for the weighted NLTS2 LEA sample and the universe. Finally, the NLTS2 participating LEAs and a sample of 1,000 LEAs that represented the universe of LEAs were surveyed to assess a variety of policies and practices known to vary among LEAs and to be relevant to secondary-school-age youth with disabilities. Analyses of both the extant databases and the LEA survey data confirm that the weighted NLTS2 LEA sample accurately represents the universe of LEAs.

The Student Samples

Determining the size of the NLTS and NLTS2 student samples took into account the duration of the study (5 and 10 years, respectively), desired levels of precision, and assumptions regarding attrition and response rates. (Obviously, these kinds of assumptions for NLTS were not informed by the experience gleaned from it and other longitudinal studies conducted in the intervening years.) The studies' sample designs called for findings to be generalizable to students receiving special education as a whole and for each of the special education disability categories in use at the time. Standard errors were to be no more than 3.2% and 3.6% for the two studies, respectively, except for the low-incidence categories. Assuming a 50% sampling efficiency, analyses for the two studies determined that approximately 13,000 and 12,000 students would need to be sampled to ensure sufficient youth would have a parent/youth interview in the final wave of each study.

LEAs and special schools were contacted to obtain their agreement to participate in the study and to request rosters of students receiving special education. NLTS sampled students ages 13 to 21, and NLTS2 sampled students ages 13 through 16. For both studies, students had to have been in at least 7th grade.[5] Requests for rosters for both studies specified that they contain the names of students receiving special education under the jurisdiction of the LEA, the disability category of each student, and the students' birth dates or ages. NLTS also requested the name of students' schools. NLTS2 requested that student addresses and telephone numbers be included on rosters; this information was obtained in a second contact with LEAs for NLTS. Some LEAs in both studies would provide only identification numbers for students, along with the corresponding birth dates and disability categories. When students were sampled in these LEAs, identification numbers of selected students were provided to the LEA, along with materials to mail to their parents/guardians (without revealing their identity).

After estimating the number of students receiving special education in the NLTS2 age range, the appropriate fraction of students in each category was selected randomly from each LEA and special school. In cases in which a family had more than one child included on a roster, only one was eligible to be selected. LEAs and special schools were notified of the students selected, and contact information for their parents/guardians was requested if it had not been provided initially.

School Data Collection

NLTS

The school data from NLTS that are reported here were collected through the Survey of Secondary Special Education Programs and by abstracting information from students' school records.[6]

In telephone interviews conducted in the summer and fall of 1987, parents of NLTS sample members were asked whether students had been enrolled in school in the 1986-87 school year and, if yes, to identify the name and location of the school. After the completion of the

[5] Students who were designated as being in ungraded programs also were sampled if they met the age criteria.

[6] More details of NLTS school data collection can be found in Wagner, Newman, & Shaver, 1989. Results of a bias study for NLTS are documented in Javitz & Wagner, 1990.

interviews, a design change in the study resulted in the need to identify and collect information from students who had last been enrolled in school in the 1985-86 school year. These schools were identified through contacts with the districts and schools from which students had been sampled.

If students had most recently attended school in one of the original NLTS participating LEAs, contacts in those LEAs were notified of the upcoming survey and asked to identify people who were qualified and willing to abstract information from students' school records; abstractors were reimbursed for each completed form. A list of the schools involved and the NLTS students thought to have attended each school also was included to verify attendance. Consent forms, which had been collected previously from parents of NLTS sample members, were included with mailings when requested by an LEA. About 400 schools in the pool of those attended by NLTS sample members were outside the original participating LEAs. Because most of these schools were attended by only one sample member, contacts were made directly with those schools' principals to notify them of the survey and to ask them to identify someone to abstract information from the student's school records. After repeated efforts, abstractors were identified in 95% of the original districts, 100% of the original special schools, and 80% of the schools that were not in the original LEAs. Completed school record abstract forms were obtained for 6,241 students, a 60% response rate. About three-fourths of the abstracts were for the 1986-87 school year (79%), with the remainder being for the 1985-86 school year. Mail questionnaires for the Survey of Secondary Special Education Programs were completed for 79% of school attended; a follow-up telephone survey of nonresponding schools resulted in another 17% of schools having partial information.

NLTS2

The large majority of school data from NLTS2 that are reported here were collected through the school characteristics survey and the student's school program survey. In addition, the general education teacher survey was used for information on students' grades for cohort 2 students who spent the majority of their time in general education classes.

The first step in the school data collection process was to identify the school attended by NLTS2 students during the 2001-02 school year. School attendance data had been collected as part of the parent interview during the summer and fall of 2001. Parent responses relating to schools were coded (e.g., address, phone) using the Quality Education Data (QED) database. For identified schools not in the QED database or for students for whom there was no parent interview, school district records collected for sampling were used to identify students' schools. Names of students thought to attend each school were sent to schools for verification using the School Enrollment form. In addition to verification of enrollment, this form requested that schools provide the name of a school staff member who would be willing to coordinate the distribution of school surveys for NLTS2 students attending each school. Participation agreements were signed by coordinators, who received reimbursement for their efforts at varying levels, depending on the number of NLTS2 students in the school.

In March 2002, packets were sent to each coordinator and to school principals in schools that did not name a coordinator, which included a general education academic teacher questionnaire for each sample member (with instructions to return the questionnaire if a student did not have such a class), a school program questionnaire for each sample member, and a single school

characteristics survey for the school. A second packet was sent in April 2002. Additional mailings were conducted to individual teachers in May 2002. By the end of the survey period, completed school program surveys were returned for 6,038 students, or 59% of eligible sample members. School information was collected for 7,545 students, either from the school characteristics survey (a response rate of 60%) or publicly available databases. General education teacher survey questionnaires were obtained for 2,822 students who took general education academic classes, a response rate of 60%.

Weighting the Wave 1 School Data

The percentages and means reported in the data tables are estimates of the true values for the population of 14- through 18-year-olds receiving special education services. The estimates are calculated from responses of parents of NLTS and NLTS2 sample members. The response for each sample member is weighted to represent the number of youth in his or her disability category in the kind of LEA (i.e., region, size, and wealth) or special school from which he or she was selected.

Exhibit A-2 illustrates the concept of sample weighting and its effect on percentages or means that are calculated for students with disabilities as a group. In this example, 10 students are included in a sample, 1 from each of 10 disability groups, and each has a hypothetical value regarding whether that student participated in organized group activities outside of school (1 for yes, 0 for no). Six students participated in such activities, which would result in an unweighted value of 60% participating. However, this would not accurately represent the national population of students with disabilities because many more students are classified as having a learning disability than orthopedic or other health impairments, for example. Therefore, in calculating a population estimate, weights in the example are applied that correspond to the

Exhibit A-2
EXAMPLE OF WEIGHTED PERCENTAGE CALCULATION

	A	B	C	D
Disability Category	Number in Sample	Participated in Group Activities	Example Weight for Category	Weighted Value for Category
Learning disability	1	1	5.5	5.5
Speech/language impairment	1	1	2.2	2.2
Mental retardation	1	1	1.1	1.1
Emotional disturbance	1	0	.9	0
Hearing impairment	1	1	.2	.2
Visual impairment	1	1	.1	.1
Orthopedic impairment	1	0	.1	0
Other health impairment	1	1	.6	.6
Autism	1	0	.2	0
Multiple disabilities	1	0	.1	0
TOTAL	10	6	10	8.7
	Unweighted sample percentage = 60% (Column B total, divided by Column A total)		Weighted population estimate = 87% (Column D total, divided by Column C total)	

proportion of students in the population that are from each disability category. (Actual study weights account for several aspects of the students and the districts from which they were chosen.) The sample weights for this example appear in column C. Using these weights, theweighted population estimate is 87%. The percentages in NLTS and NLTS2 are similarly weighted population estimates, whereas the sample sizes are the actual number of cases on which the weighted estimates are based (similar to the 10 cases in Exhibit A-2).

The students in LEAs and state schools with parent interview/survey data were weighted to represent the universe of students in LEAs and state schools at the two study time points. NLTS weighting procedures are detailed in Javitz & Wagner (1990). NLTS2 used the following process:

- For each of the 64 LEA sampling cells, an LEA student sampling weight was computed. This weight is the ratio of the number of students in participating LEAs in that cell, divided by the number of students in all LEAs in that cell in the universe of LEAs. The weight represents the number of students in the universe who are represented by each student in the participating LEAs. For example, if participating LEAs in a particular cell served 4,000 students and if the universe of LEAs in the cell served 400,000 students, the LEA student sampling weight would be 100.
- For each of the 64 LEA cells, the number of students in each disability category was estimated by multiplying the number of students with that disability on the rosters of participating LEAs in a cell by the adjusted LEA student sampling weight for that cell. For example, if 350 students with learning disabilities were served by LEAs in a cell, and the LEA student sampling weight for that cell was 100 (i.e., each student in the sample of participating LEAs in that cell represented 100 students in the universe), estimates would suggest 35,000 students with learning disabilities in that cell in the universe.
- For the state schools, the number of students in each disability category was estimated by multiplying the number of students with that disability on the rosters by the inverse of the proportion of state schools that submitted rosters.
- The initial student sampling weights were adjusted by disability category so that the sum of the weights (i.e., the initial student sampling weights, multiplied by the number of students for whom interviews were completed) was equal to the number of students in the geographical and wealth cells of each size strata. The adjustments were typically small and essentially served as a nonresponse adjustment. However, the adjustments could become substantial when there were relatively few interviewees (as occurred in the small and medium strata for the lowest incidence disabilities) because in these cases, some cells might not have any interviewees, and it was necessary to adjust the weights of other interviewees to compensate. Two constraints were imposed on the adjustments: (1) within each size stratum, the cell's weights could not vary from the average weight by more than a factor of 2, and (2) the average weight within each size stratum could not be larger than 4 times the overall average weight. These constraints substantially increased the efficiency of the sample at the cost of introducing a small amount of weighting bias (discussed below).

- In a final step, the weights were adjusted so that they summed to the number of students in each disability category, as reported to OSEP by the states for the 2000-2001 school year (OSEP, 2001).

The imposition of constraints on the adjusted weights increased sampling efficiency at the cost of introducing a small amount of bias. The average efficiency increased from 51.7% to 67.4%; the largest increases in sampling efficiency occurred for youth with emotional disturbances (from 44.4% to 81.0%) and for those with multiple disabilities (from 32.1% to 56.8%). Biases introduced by the imposition of constraints on the student weights generally were very small. The largest bias in size distribution was for youth with visual impairments (decreasing from 17.1% in the smallest size stratum to 11.6%) and those with autism (decreasing from 21.3% in the smallest size stratum to 17.5%). All other changes in the size distribution were 1.5% or less, and the average absolute change was only 0.4%. The largest bias in wealth distribution was for those with multiple disabilities (from 22.2% in wealth stratum 3 to 16.6%, and from 18.3% in wealth stratum 4 to 22.0%). All other changes were 2.1% or less, and the average absolute change was only 0.6%. All biases in regional distribution were 2.1% or less, and the average absolute change was only 0.5%. Considering the increase in sampling efficiency, these biases are considered acceptable.

The reason for the reduction in the proportion of students represented in the cells mentioned above is that there were relatively few students with interview/survey data in those cells. For example, small LEAs had only 21 students with visual impairments with data, requiring that they represent an estimated 1,701 students with visual impairments from small LEAs. The weighting program determined that the average weight required (i.e., 81.0) violated the constraints, and therefore reduced these weights to a more reasonable value (i.e., 56.2).

Analytic Adjustment to Increase the Comparability of Study Samples

The NLTS and NLTS2 samples are similar in many respects. Yet, they differ in important ways that make a comparison between youth in the full samples of the two studies inadvisable because misleading conclusions could be drawn from such comparisons. One important distinction is the age of youth in the two studies. NLTS includes youth who were ages 13 to 21 when selected and 14 to 22 in their most recent school year (1985-86 or 1986-87). NLTS2, in contrast, includes youth who were 13 to 16 when selected and 14 to 18 when Wave 1 school data were collected. Thus, the full sample of youth with NLTS Wave 1 school data included youth who were older than any in NLTS2 (19- through 22-year-olds), and NLTS2 included youth who were younger than any included in NLTS (13-year-olds). Because age is such a powerful determinant of the experience of adolescents, comparisons made in this report between the two studies include only youth in the age range that overlaps the two studies, 14- through 18-year-olds.

Even with limiting the comparisons to youth in this age range, the comparability of the two samples was questionable because there were many more 18-year-olds in NLTS than NLTS2. To create age-equivalent samples, NLTS2 youth were weighted to match the age distribution of NLTS; 19% are 14, 22% are 15, 24% are 16, 33% are 17, and 2% are 18.

One other difference between the study samples that has been accommodated through analytic adjustments to enhance comparability involves the different system of disability classification in use at the time the two studies were conducted. The following adjustments have been made:

- The two NLTS categories of deaf and hard of hearing were combined to be comparable to the single NLTS2 category of hearing impairment.
- In both cohorts, students with deaf-blindness were included in the multiple impairments category because there were too few to report separately.
- Because the categories of autism and traumatic brain injury were not in use in 1987, NLTS2 students with autism or traumatic brain injury were included in other categories, using descriptions of the primary disability provided by parents. If parents said the primary disability of these students was autism or traumatic brain injury, with no other information provided, students were included in the other health impairment category, where they most likely would have been classified in 1987. If more than one disability, in addition to autism or traumatic brain injury, was mentioned by parents, students were included in the multiple impairments category. This distribution mirrors the fairly broad dispersion of NLTS students known to have autism or traumatic brain injuries.

Estimating Standard Errors

Each estimate reported in the data tables is accompanied by a standard error. A standard error acknowledges that any population estimate that is calculated from a sample will only approximate the true value for the population. The true population value will fall within the ranged demarcated by the estimate, plus or minus the standard error 95% of the time. For example, if the cohort 2 estimate for youth's current employment rate is 29%, with a standard error of 1.8 (as reported in Exhibit 5-7), one can be 95% confident that the true current employment rate for the population is between 27.2% and 30.8%.

Because the NLTS and NLTS2 samples are both stratified and clustered, calculating standard errors by formula is not straightforward. Standard errors for means and proportions were estimated using pseudo-replication, a procedure that is widely used by the U.S. Census Bureau and other federal agencies involved in fielding complex surveys. To that end, a set of weights was developed for each of 32 balanced half-replicate subsamples. Each half-replicate involved selecting half of the total set of LEAs that provided contact information using a partial factorial balanced design (resulting in about half of the LEAs being selected within each stratum) and then weighting that half to represent the entire universe. The half-replicates were used to estimate the variance of a sample mean by: (1) calculating the mean of the variable of interest on the full sample and each half-sample using the appropriate weights; (2) calculating the squares of the deviations of the half-sample estimated from the full sample estimate; and (3) adding the squared deviations and dividing by (n-1), where n is the number of half-replicates.

Although the procedure of pseudo-replication is less unwieldy than the development of formulas for calculating standard errors, it is not easily implemented using the Statistical Analysis System (SAS), the analysis program used for NLTS and NLTS2, and it is

computationally expensive. Experience has demonstrated that it is possible to develop straightforward estimates of standard errors using the effective sample size.

When respondents are independent and identically distributed, the effective sample size for a weighted sample of N respondents can be approximated as

$$Neff = N \times (E^2[W] / (E^2[W] + V[W]$$

where Neff is the effective sample size, $E^2[W]$ is the square of the arithmetic average of the weights and V[W] is the variance of the weights. For a variable X, the standard error of estimate can typically be approximated by sqrt(V[X]/Neff), where V[X] is the weighted variance of X.

Respondents are not independent of each other because they are clustered in LEAs, and the intracluster correlation is not zero. However, because the intracluster correlation traditionally has been quite small, the formula for the effective sample size shown above has worked well. To be conservative, however, the initial estimate was multiplied by a "safety factor" to assure that the standard error of estimate was not underestimated.

To determine the adequacy of fit of the variance estimate based on the effective sample size and to estimate the required safety factor, 24 questions with 95 categorical and 2 continuous responses were selected. Standard errors of estimates for each response category and the mean response to each question were calculated for each disability group using both pseudo-replication and the formula involving effective sample size. A safety factor of 1.25 resulted in the effective sample size standard error estimate underestimating the pseudo-replicate standard error estimate for 92% of the categorical responses and 89% of the mean responses. Because the pseudo-replicate estimates of standard error are themselves estimates of the true standard error, and are therefore subject to sampling variability, this can be considered an adequate margin of safety.

Unweighted and Weighted Sample Sizes

As indicated above, standard errors accompany all estimates reported in the data tables. How close an estimate comes to a true population value is influenced by the size of the sample on which the estimate is based. Larger samples yield estimates with smaller standard errors, indicating that those estimates are closer to true population values than estimates with larger standard errors based on smaller samples.

The actual, or "unweighted." sample sizes for each variable reported in the data tables are included in Appendix B. However, some readers may be interested in determining the number of youth in the nation represented by a particular estimate (e.g., if 29% of youth in cohort 2 took a particular kind of class, how many youth in the country took the same kind of class?). A first step in determining these "weighted" sample sizes involves multiplying the percentage estimate by the actual number of youth in the nation represented by that estimate (see example below). However, 95% of the time, the true population value is likely to diverge from that estimate by as much as the amount of the standard error. Therefore, it is more appropriate to use the standard error to calculate a range in the number of youth represented by an estimate, rather than relying on the single value resulting from multiplying the estimate by the size of the population it represents.

Consider the example depicted in Exhibit A-3. NLTS2 findings indicate that 87.6% of cohort 2 youth took at least one course in a general education class (see Exhibit 3-4). The standard error accompanying that estimate is 1.3, indicating that the true current general education participation rate for the population is likely to fall between 86.3% and 88.9%. Cohort 2 represents a total of 2,080,729 students receiving special education services. Multiplying the percentages by this population size yields a single-point estimate of an estimate of 1,822,719 and a range of 1,795,669 to 1,849,768, within which the actual population size will fall, with 95% confidence.

Exhibit A-3
EXAMPLE OF CALCULATING WEIGHTED SAMPLE SIZES

A	B	C	D	E	F
Percentage Estimate	Standard Error	Range around Estimate (Column A Plus or Minus Column B)	Population Size	Single-point Weighted Population Affected (Column A x Column D)	Range in Weighted Population Affected (Column C x Column D)
87.6	1.3	86.3 to 88.9	2,080,729	1,822,719	1,795.669 to 1,849,768

Because percentage estimates are provided not only for the full sample of youth with disabilities in each cohort, but also for youth who differ in primary disability category, gender, household income, and race/ethnicity, readers must have the actual population size for each of these subgroups to calculate weighted sample sizes for some estimates. These population sizes are presented in Exhibit A-4.

Exhibit A-4
POPULATION SIZES OF GROUPS REPRESENTED BY NLTS AND NLTS2

Groups	Cohort 1	Cohort 2
All youth with disabilities	966,464	2,080,729
Disability category:		
Learning disability	572,394	1,288,923
Speech/language impairment	37,883	82,038
Mental retardation	204,221	253,354
Emotional disturbance	100,279	238,083
Hearing impairment	14,177	27,580
Visual impairment	6,527	10,726
Orthopedic impairment	9,344	24,388
Other health impairment (includes autism)	11,132	110,452
Multiple disabilities (includes deaf-blindness)	10,406	39,183
Grade level		
7th or 8th	159,855	241,289
9th	229,922	440,491
10th	216,678	508,837
11th	185,152	486,356
12th	98,374	316,974
Gender		
Boys	533,376	1,375,464
Girls	252,509	696,011
Household income		
Lowest	220,062	625,266
Middle	198,931	519,910
Highest	223,025	640,181
Race/ethnicity		
White	505,357	1,317,104
African American	162,341	423,213
Hispanic	66,276	277,155

Calculating Significance Levels

In general, references in the text of the report to differences between groups highlight only differences that are statistically significant with at least 95% confidence (denoted as $p<.05$). Beyond the differences highlighted in the text, readers may want to compare percentages or means for specific subgroups to determine, for example, whether the difference in the percentage of students who are male between students with learning disabilities and those with hearing impairments is greater than would be expected to occur by chance. To calculate whether the difference between percentages is statistically significant, the squared difference between the two percentages of interest is divided by the sum of the two squared standard errors. If this product is larger than 3.84, the difference is statistically significant at the .05 level (i.e., it would occur by chance fewer than 5 times in 100). Presented as a formula, a difference in percentages is statistically significant at the .05 level if:

$$\frac{(P_1P_2)^2}{SE_1^2 + SE_2^2} > 1.96^2$$

where P_1 and SE_1 are the first percentage and its standard error, and P_2 and SE_2 are the second percentage and its standard error. If the product of this calculation is 6.63 to 10.79, the significance level is .01; products of 10.8 or greater are significant at the .001 level.

Measurement Issues

The chapters in this report include information on variables that were included in both NLTS and NLTS2. If there were differences between the studies in how a particular variable was defined, those differences are highlighted in the discussion of findings related to that variable. However, several general points about measures are used repeatedly in analyses that should be clear to readers as they consider the findings reported here.

Categorizing students by primary disability. Information about the nature of students' disabilities came from rosters of all students in the study age ranges who were receiving special education in the sample school years under the auspices of participating LEAs and state-supported special schools. For analysis purposes, students in both studies were assigned to a disability category on the basis of the primary disability designated by the student's school or district. Although there are federal guidelines for making category assignments criteria, methods for assigning students to categories vary from state and to state and even between districts within states, with the potential for substantial variation in the nature and severity of disabilities included in categories (see for example, MacMillan & Siperstein, 2002). Therefore, data should not be interpreted as describing students who truly had a particular disability, but rather as describing students who were categorized as having that primary disability by their school or district. Hence, descriptive data are nationally generalizable to youth in the 15- to 17-year-old age range who were classified as having a particular primary disability in the school year in which they were selected for the NLTS or NLTS2 sample.

Demographic characteristics. Findings in this report are provided for youth who differ in grade level, gender, household income, and race/ethnicity. Grade level was reported by schools for students in the school year for which data were collected (1985-86 or 1986-87 in the case of NLTS, 2000-01 in the case of NLTS2). For NLTS, gender and race/ethnicity were obtained from parents through telephone interviews, whereas for NLTS2, these data were requested from and supplied by many school districts on student rosters. Classifying the income of students' households relied exclusively on information provided during the parent interview/survey. When variations in NLTS and NLTS2 variables between income groups are described, designations of lower, medium, and higher are used. These were constructed by dividing the income distribution of each study into approximate thirds. Thus, the categories indicate income relative to other youth in the study, not to a fixed income amount.

School program measures. Measures of NLTS students' school programs were constructed from the school record abstract form, which indicated each course a student took (e.g., geometry, world literature, band) in his or her most recent school year and whether the

course was taken in a general or special education class. The subject areas of classes were then collapsed into the categories of language arts, mathematics, science, social studies, foreign language, prevocational education, occupationally specific vocational education, fine arts or performing arts, physical education, life skills, and study skills.[7]

Information on course taking and instructional settings for NLTS2 students was collected from the student's school program survey. Respondents were given the course categories indicated above and asked to indicate whether the student was taking that kind of course in the 2000-01 spring semester. If the student was attending a regular secondary school, the respondent was asked to indicate whether it was taken in a general education class, a special education class, through individual instruction (e.g., home/hospital), or in a community setting. If a student attended a special school, the course settings were a class at that school, a class at another location, individual instruction, or a community setting. Classes at the special school were considered special education classes and those at another school were considered taken in a community setting. In both studies, the subjects of courses were further collapses by considering both prevocational and occupationally specific vocational education as vocational education and considering both life skills and study skills as life skills. Language arts, mathematics, science, and social studies were considered academic courses, whereas the remaining types of courses were considered nonacademic.

Students' absenteeism. The number of days absent for NLTS students was reported on the school record abstract form for each student for his or her most recent school year (1985-86 or 1986-87). Because school information was collected for NLTS2 students in the spring of the 2000-01 school year, absenteeism for the full year could not be obtained. Therefore, respondents to the Student's School Program Survey were asked to report the number of days the student was absent in February 2001. To make the measures of absenteeism in the two studies comparable, the total number of days NLTS students were absent in the school year was divided by 9 to make that measure the equivalent of 1 month, as measured in NLTS2.

Students' grades. NLTS grades were reported on the school record abstract form for each course a student had taken in his or her most recently school year. An overall grade point average (GPA) for the year was calculated on a 4-point scale. GPAs were collapsed into five categoriess (As through Fs) such that a GPA of 3.5 to 4 was considered "mostly As," 2.5 to 3.49 was considered "mostly Bs," 1.5 to 2.49 was considered "mostly Cs," .5 to 1.49 was considered "mostly Ds," and 0 to .5 was considered "mostly Fs."

NLTS2 grades were reported by school staff for the first general education academic class a given student took in the week, if the student had such a class. Grades also were reported for a nonvocational special education class if the student took such a class. In cases in which both grade measures were reported, the proportion of classes the student took in the two settings was calculated, and the grade measure for the kind of class in which he or she took the most courses was selected.

Grades were reported by school staff on a 9-point scale. These categories were collapsed into the five categories used in this report, as indicated in Exhibit A-5.

[7] Details of the course categorization are available in Valdes (1990).

Exhibit A-5
NLTS2 MEASURES OF STUDENTS' GRADES

	Category Values Reported by School Staff Respondents	Collapsed Categories Used for Comparison Purposes
Mostly As	1	1 or 2
Mostly As and Bs	2	
Mostly Bs	3	3 or 4
Mostly Bs and Cs	4	
Mostly Cs	5	5 or 6
Mostly Cs and Ds	6	
Mostly Ds	7	7 or 8
Mostly Ds and Fs	8	
Mostly Fs	9	9

Community resources. Community resources were assessed in the school background in NLTS and in the school characteristics survey in NLTS2. The two studies differed in the wording of the questionnaire items from which community resource information was taken, which may result in an overstatement of the degree of change in resources. NLTS asked respondents about the presence of different kinds of educational institutions and other kinds of programs, using the following two questions: "Are the following types of schools available in your community?" and "Does your community have the following resources?" NLTS2 asked a single question, with response categories similar to NLTS, but used a different geographic reference: "Which of the following are available in this community or nearby (e.g., within 20 miles)?" If the geographic area referred to in NLTS2 was larger than what respondents in NLTS considered their "community," a higher prevalence of some programs could result.

Reporting statistics. Statistics are not reported for groups with fewer than 35 members. Statistics with a decimal of .5 are rounded to the nearest even whole number.

APPENDIX A REFERENCES

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Appendix B

UNWEIGHTED SAMPLE SIZES

Exhibit B-1
UNWEIGHTED SAMPLE SIZES FOR EXHIBITS WITH ALL YOUTH WITH DISABILITIES: EXHIBITS 2-2 TO 2-6, 3-1 TO 3-3, 3-5, AND 4-1 TO 4-3

	Cohort 1	Cohort 2
Exhibit 2-1		
Type of school	5,496	5,672
Type of community	4,636	5,655
Exhibit 2-2	5,418	5,400
Exhibit 2-3		
Race/ethnicity	5,292	5,252
Free/reduced price lunch eligibility	5,295	5,461
Exhibit 2-4	5,191	5,583
Exhibit 2-5		
Title I availability	5,496	5,654
ESL program availability	5,496	5,654
Placement options	3,585	4,778
Exhibit 2-6	3,779	3,313
Exhibit 3-1		
Any academic course	4,492	5,597
Language arts	4,492	5,491
Mathematics	4,492	5,475
Science	4,492	5,357
Social studies	4,492	5,372
Foreign language	4,492	5,597
Exhibit 3-2		
Any nonacademic course	4,492	5,597
Vocational education	4,492	5,597
Fine arts/performing arts	4,492	5,597
Physical education	4,492	5,597
Life skills/study skills	4,492	5,597
Exhibit 3-3	4,866	5.562
Exhibit 3-5	3,578	4,776
Exhibit 3-6		
Speech/language therapy	4,694	4,805
Mental health services	4,694	4,555
Special transportation	4,694	4,782
Social work services	4,694	4,470
Adaptive physical education	4,694	4,884
Assistive devices/adaptations	4,694	4,770
Occupational therapy	4,694	4,702
Health services	4,694	4,625
Physical therapy	4,694	4,656
Audiology services	4,694	4,666
Orientation/mobility training	4,694	4,680
Exhibit 4-1	4,143	4,828
Exhibit 4-2	3,978	2,178
Exhibit 4-3	4,871	3,550

Exhibit B-2
UNWEIGHTED SAMPLE SIZES FOR EXHIBIT 3-4

	General Education		Special Education	
	Cohort 1	Cohort 2	Cohort 1	Cohort 2
Any academic course	4,249	5,330	4,249	5,330
Language arts	4,131	5,127	4,131	5,127
Mathematics	3,520	4,982	3,520	4,982
Science	2,569	4,252	2,569	4,252
Social studies	3,245	4,416	3,245	4,416
Any nonacademic course	3,702	5,043	3,702	5,043
Vocational education	3,034	3,628	3,034	3,628
Fine arts/performing arts	1,505	2,985	1,505	2,985
Life skills/study skills	1,375	2,612	1,375	2,612

Exhibit B-3
UNWEIGHTED SAMPLE SIZES FOR EXHIBITS FOR DISABILITY CATEGORIES: EXHIBITS 2-7 TO 2-10, 3-6 TO 3-11, AND 4-4 TO 4-6

	Learning Disability	Speech/ Language Impairment	Mental Retardation	Emotional Disturbance	Hearing Impairment	Visual Impairment	Orthopedic Impairment	Other Health Impairment	Multiple Disabilities/ Deaf-blindness
Exhibit 2-7									
Type of school	802/527	434/540	722/572	522/353	1,136/643	634/465	479/574	321/1,172	446/592
Type of community	793/537	429/544	702/575	492/354	765/619	388/470	472/577	313/1,164	282/580
Exhibit 2-8									
Enrollment	789/512	418/503	704/546	516/338	1,133/611	626/456	476/547	314/1,115	442/556
Race/ethnicity	772/479	418/497	697/523	510/320	1,109/585	584/453	465/536	305/1,091	432/545
Free/reduced price lunch eligibility	777/513	424/529	710/551	510/336	1,094/606	583/451	468/554	301/1,140	428/564
Percentage of students with disabilities	734/522	403/524	648/557	492/345	1,114/635	614/466	468/563	296//1,155	422/586
Exhibit 2-9									
Title I availability	802/529	434/541	722/566	522/354	1,136/640	634/470	479/575	321/1,159	446/585
ESL program availability	802/529	434/541	722/566	522/354	1,136/640	634/470	479/575	321/1,159	446/585
Placement options	688/531	361/538	519/537	394/326	572/332	319/218	369/554	235/1,042	128/476
Exhibit 2-10	550/378	284/378	483/355	365/250	790/236	458/156	363/399	181/707	305/229
Exhibit 3-6									
Any academic course									
Language arts	687/533	352/478	615/545	443/348	968/599	479/489	391/580	247/1,149	310/555
Mathematics	687/533	352/476	615/544	443/348	968/592	479/486	391/584	247/1,148	310/554
Science	687/532	352/465	615/531	443/334	968/576	479/469	391/577	247/1,127	310/539
Social studies	687/535	352/474	615/525	443/340	968/589	479/475	391/576	247/1,115	310/536
Foreign language	687/548	352/487	615/557	443/352	968/601	479/496	391/600	247/1,170	310/565
Exhibit 3-7	687/548	352/487	615/557	443/352	968/601	479/496	391/600	247/1,170	310/565
Exhibit 3-8	722/545	382/485	690/552	468/351	998/600	509/496	439/594	262/1,167	396/552
Exhibit 3-9	722/545	382/485	690/552	468/352	998/600	509/496	439/594	262/1,167	396/552
Exhibit 3-10	722/545	382/485	690/552	468/351	998/600	509/496	439/594	262/1,167	396/552
Any general education academic	678/543	346/481	573/525	436/348	950/596	458/457	377/576	233/1,118	198/470
Any special education academic	678/543	346/481	573/525	436/348	950/596	458/457	377/576	233/1,118	198/470
General education language arts	659/509	340/464	545/510	425/336	934/590	440/441	365/544	230/1,075	193453
Special education language arts	659/509	340/464	545/510	425/336	934/590	440/441	365/544	230/1,075	193/453
General education mathematics	516/494	286/451	483/504	369/323	823/566	380/427	302/537	198/1,048	163440

Sample sizes are presented in the following format: cohort 1/cohort 2.

Exhibit B-3
UNWEIGHTED SAMPLE SIZES FOR EXHIBITS FOR DISABILITY CATEGORIES: EXHIBITS 2-7 TO 2-10, 3-6 TO 3-11, AND 4-4 TO 4-6 (Concluded)

	Learning Disability	Speech/ Language Impairment	Mental Retardation	Emotional Disturbance	Hearing Impairment	Visual Impairment	Orthopedic Impairment	Other Health Impairment	Multiple Disabilities/ Deaf-blindness
Exhibit 3-10 (concluded)									
General education science	399/452	242/411	290/388	293/290	615/490	287/356	213/478	145/883	85/340
Special education science	399/452	242/411	290/388	293/290	615/490	287/356	213/478	145/883	85/340
General education social studies	533/486	270/428	388/390	362/318	736/498	377/393	296/481	175/899	108339
Special education social studies	533/486	270/428	388/390	362/318	736/498	377/393	296/481	175/899	108339
Exhibit 3-11									
Any nonacademic general education	563/481	291/429	509/512	343/306	798/543	422/454	310/514	206/1,072	260/534
Any nonacademic special education	563/481	291/429	509/512	343/306	798/543	422/454	310/514	206/1,072	260/534
Special education vocational education	500/315	218/257	443/425	283/209	705/418	305/335	227/334	156/771	197/433
General education fine arts/performing arts	227/262	136/257	163/274	145/152	249/296	260/335	115/308	87/646	123/345
Special education fine arts/performing arts	227/262	136/257	163/274	145/152	249/296	260/335	115/308	87/646	123/345
General education physical education	444/389	222/365	420/427	291/252	614/448	302/369	192/370	142/856	207/467
Special education physical education	444/389	222/365	420/427	291/252	614/448	302/369	192/370	142/856	207/467
General education life skills/study skills	166/136	80/119	287/393	90/152	287/221	153/265	128/227	74/574	153/432
Special education life skills/study skills	166/136	80/119	287/393	90/152	287/221	153/265	128/227	74/574	153/432
Exhibit 3-12									
Speech/language therapy	680/478	355/344	670/512	452/295	975/512	493/404	430/498	246/1,058	393/513
Mental health services	680/455	355/332	670/473	452/297	975/513	493/402	430/459	246/968	393/472
Special transportation	680/468	355/336	670/510	452/291	975/515	493/401	430/517	246/1,038	393/516
Social work services	680/449	355/326	670/468	452/294	975/502	493/382	430/443	246/970	393/453
Adaptive physical education	680/484	355/325	670/514	452/297	975/525	493/450	430/523	246/1,045	393/527
Assistive devices/adaptations	680/478	355/325	670/494	452/296	975/522	493/440	430/509	246/1,015	393/500
Occupational therapy	680/468	355/335	670/495	452/292	975/517	493/395	430/497	246/1,008	393/511
Health services	680/472	355/317	670/492	452/292	975/510	493/417	430/478	246/977	393/483
Physical therapy	680/468	355/332	670/491	452/288	975/515	493/389	430/499	246/982	393/511
Audiology services	680/476	355/334	670/491	452/297	975/539	493/404	430/474	246/987	393/475
Orientation/mobility training	680/473	355/334	670/495	452/292	975/514	493/430	430/475	246/986	393/493
Exhibit 4-4	635/475	306/406	611/500	395/297	876/515	438/438	345/502	211/1,018	326.490
Exhibit 4-5	652/319	339/314	511/117	405/165	922/185	434/146	331/275	221/485	163/79
Exhibit 4-6	557/455	266/408	523/489	320/282	756/520	391/462	285/548	168/1,023	284/498

Sample sizes are presented in the following format: cohort 1/cohort 2.

Exhibit B-4
UNWEIGHTED SAMPLE SIZES FOR EXHIBITS BY GRADE LEVEL: EXHIBITS 3-12 TO 3-16, 4-7 TO 4-9

	Grade Level				
	7th or 8th	9th	10th	11th	12th
Exhibit 3-13					
Mathematics	550/744	884/1,137	946/1,392	860/1,134	795/572
Science	550/737	884/1,121	946/1,362	860/1,104	795/558
Social studies	550/741	884/1,110	946/1,357	860/1,117	795/573
Foreign language	550/749	884/1,158	946/1,413	860/1,166	795/601
Exhibit 3-14	550/749	884/1,158	946/1,413	860/1,166	795/601
Exhibit 3-15	588/748	928/1,153	983/1,406	897/1,164	828/597
Exhibit 3-16					
Any general education academic course	538/730	866/1,112	920/1,370	841/1,138	777/576
Any special education academic course	538/730	866/1,112	920/1,370	841/1,138	777/576
General education language arts	531/743	854/1,130	905/1,388	822/1,147	726/584
Special education language arts	531/743	854/1,130	905/1,388	822/1,147	726/584
General education mathematics	530/744	840/1,137	833/1,392	618/1,134	429/572
General education science	474/737	641/1,121	672/1,362	415/1,104	262/558
Special education science	474/737	641/1,121	672/1,362	415/1,104	262/558
General education social studies	479/741	661/1,110	623/1,357	708/1,117	632/573
Special education social studies	479/741	661/1,110	623/1,357	708/1,117	632/573
Exhibit 3-17					
Any general education nonacademic course	507/721	809/1,085	779/1,285	638/974	567/499
Any special education nonacademic course	507/721	809/1,085	779/1,285	638/974	567/499
General education fine arts/performing arts	243/547	314/537	273/727	244/554	247/278
Special education fine arts/performing arts	243/547	314/537	273/727	244/554	247/278
General education life skills/study skills	169/383	244/472	247/620	246/500	253/216
Special education life skills/study skills	169/383	244/472	247/620	246/500	253/216
Exhibit 4-7	481/658	785/999	854/1,209	771/1,011	710/508
Exhibit 4-8	498/338	824/492	892/574	820/486	760/256
Exhibit 4-9	417/654	665/994	692/1,206	683/1,031	615/526

Exhibit B-5
UNWEIGHTED SAMPLE SIZES FOR EXHIBITS BY GENDER: EXHIBITS 3-18 AND 4-10 TO 4-12

	Males		Females	
	Cohort 1	Cohort 2	Cohort 1	Cohort 2
Exhibit 3-18	2,324	3,517	1,483	2,029
Exhibit 4-10	2,144	3,034	1,377	1,748
Exhibit 4-11	2,064	1,381	1,322	781
Exhibit 4-12	1,812	3,014	1,175	1,813

Exhibit B-6
UNWEIGHTED SAMPLE SIZES FOR EXHIBITS BY INCOME AND RACE/ETHNICITY: EXHIBITS 2-11 TO 2-14, 3-18 TO 3-21, AND 4-13 TO 4-15

	Income			Race/Ethnicity		
	Low	Medium	High	White	African American	Hispanic
Exhibit 2-11						
Type of school	806/1,387	966/1,376	1,526/1,650	2,545/3,828	816/2,047	365/553
Type of community	814/756	993/927	1,602/1,470	2,557/2,409	850/800	443/397
Exhibit 2-12						
Enrollment	968/1,331	1,171/1,312	1,839/1,564	3,032/3,632	999/1,007	466//529
Race/ethnicity	950/1,267	1,141/1,283	1,793/1,532	2,946/3,571	984/956	458/502
Free/reduced price lunch eligibility	944/1,335	1,148/1,322	1,787/1,601	2,953/3,683	976/1,015	455/532
Percentage students with disabilities	917/1,366	1,111/1,349	1,778/1,631	2,880/3,758	967/1,043	458/542
Exhibit 2-13						
Title I eligibility	NA	NA	NA	3,070/3,812	1,012/1,040	477/558
ESL program eligibility	NA	NA	NA	3,070/3,812	1,012/1,040	477/558
Placement options	NA	NA	NA	2,064/3,324	582/796	320/463
Exhibit 2-14	668/757	804/820	1295/1,057	2,190/2,313	666/554	283/319
Exhibit 3-19						
Mathematics	784/1,401	921/1,394	1,441/1,584	2,400/3,594	807/1,087	340/578
Science	784/1,366	921/1,363	1,441/1,554	2,400/3,527	807/1,064	340/555
Social studies	784/1,367	921/1,359	1,441/1,564	2,400/3,536	807/1,057	340/563
Foreign language	784/1,439	921/1,416	1,441/1,618	2,400/3,666	807/1,113	340/595
Exhibit 3-20	784/1,439	921/1,416	1,441/1,618	2,400/3,666	807/1,113	58/596
Exhibit 3-21	784/1,439	921/1,416	1,441/1,618	2,400/3,666	807/1,113	340/595
Any general education academic course	741/1,354	876/1,354	1,377/1,553	2,278/3,496	756/1,054	326/569
Any special education academic course						
Special education language arts	721/1,307	856/1,302	1,337/1,491	2,209/3,354	854/1,018	319/550
General education mathematics	619/1,286	730/1,268	1,142/1,436	1,873/3,263	651/990	274/532
General education science	459/1,101	527/1,050	822/1,247	1,360/2,777	468/871	183/441
General education social studies	553/1,115	664/1,102	1,078/1,293	1,755/2,902	572/873	248/461
Special education social studies	553/1,115	664/1,102	1,078/1,293	1,755/2,902	572/873	248/461

Sample sizes are presented in the following format: cohort 1/cohort 2.
NA=Not applicable; not included in the exhibit

Exhibit B-6
UNWEIGHTED SAMPLE SIZES FOR EXHIBITS BY INCOME AND RACE/ETHNICITY: EXHIBITS 2-11 TO 2-14, 3-18 TO 3-21, AND 4-13 TO 4-15 (Concluded)

	Income			Race/Ethnicity		
	Low	Meidum	High	White	African American	Hispanic
Exhibit 3-22						
Any general education nonacademic course	649/1,293	768/1,289	1,191/1,444	1,969/3,306	662/1,004	286/527
Any special education nonacademic course	649/1,293	768/1,289	1,191/1,444	1,969/3,306	662/1,004	286/527
General education life skills/study skills	243/739	277/693	434/659	747/1,663	245/579	87/252
Special education life skills/study skills	243/739	277/693	434/659	747/1,663	245/579	87/252
Exhibit 3-23						
Mental health services	807/1,172	942/1,144	1,497/1,322	2,494/3,020	819/883	362/469
Health services	807/1,200	942/1,173	1,497/1,324	2,494/3,076	819/904	362/458
Assistive devices/ adaptations	807/1,229	942/1,205	1,497/1,384	2,494/3,170	819/922	362/481
Exhibit 4-13	734/1,256	860/1,211	1,313/1,408	2,238/3,185	752/937	299/510
Exhibit 4-14	702/450	835/539	1,284/768	2,149/1,588	693/313	308/198
Exhibit 4-15	602/1,210	743/1,229	1,131/1,458	1,943/3,236	611/946	235/496

Sample sizes are presented in the following format: cohort 1/cohort 2.