

November 2003



NATIONAL LONGITUDINAL  
**TRANSITION STUDY 2**

# **THE ACHIEVEMENTS OF YOUTH WITH DISABILITIES DURING SECONDARY SCHOOL**

**A Report from 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, Camille Marder, Jose Blackorby, Renée Cameto, Lynn Newman, Phyllis Levine, and Elizabeth Davies-Mercier (with Michael Chorost, Nicolle Garza, Anne-Marie Guzman, and Carl Sumi)

## **SRI Project P11182**

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## EXECUTIVE SUMMARY

Recent reforms in the American education system, codified in the *No Child Left Behind Act of 2001* (NCLB, P. L. 107-110), emphasize the accountability of schools, school districts, and states for the academic performance of all students. This emphasis on improved academic performance is consistent with the intention of federal legislation that guides the provision of special education services for children and youth with disabilities—the Individuals with Disabilities Education Act Amendments of 1997 (IDEA '97). That act states: “Improving educational results for children with disabilities is an essential element of our national policy of ensuring equality of opportunity, full participation, independent living, and economic self-sufficiency for individuals with disabilities” [Sec. 601(c)(1)]. Yet academic performance is not the ultimate outcome by which the education of youth with disabilities is to be assessed. The intention of the free appropriate public education guaranteed by IDEA to children and youth with disabilities is to “prepare them for employment and independent living” [Sec. 601(d)(1)(A)].

This purpose suggests the multidimensional nature of the achievements or outcomes desired for children and youth with disabilities. Yet specifying desired outcomes is only a first step toward an effective accountability system; only when data are available on how youth with disabilities fare across multiple outcome domains can America’s education system actually be accountable for the academic performance and postschool preparation of its students.

The Office of Special Education Programs (OSEP) of the U.S. Department of Education has commissioned a 10-year study that is generating the information needed to assess the achievements of youth with disabilities in their secondary school years in multiple domains. The National Longitudinal Transition Study-2 (NLTS2) is documenting the characteristics, experiences, and outcomes of a nationally representative sample of more than 11,000 youth who were ages 13 through 16 and were receiving special education services in grade 7 or higher on December 1, 2000. NLTS2 findings generalize to youth with disabilities nationally and to youth in each of the 12 federal special education disability categories in use for students in the NLTS2 age range.

This rich source of information will support a series of reports that will emerge over the life of NLTS2. This report considers the following questions for secondary-school-age youth with disabilities:

- What are the achievements of youth with disabilities in key outcome domains?
- How do achievements vary for youth with different kinds of disabilities?
- What individual, household, and school factors are related to more positive outcomes for youth with disabilities?

### Youth Outcomes

NLTS2 is able to address these questions with measures of outcomes that span multiple domains, including:

- **School engagement**—attending school and being actively engaged in learning activities there.

ES-1

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- **Academic performance**—mastering academic skills.
- **Social adjustment**—exhibiting social skills, being socially integrated, and avoiding negative behavior.
- **Independence**—demonstrating skills that support independence and assuming responsibilities at home and in the community.

Several sources of information have been used to measure outcomes in these domains and factors related to them. In telephone interviews, parents reported on such topics as the activities of youth outside of school, youth's functioning, household characteristics, and their expectations for the youth's future. Three mail surveys conducted in the 2001-02 school year generated information on students' overall school programs; on their activities and performance in general, special, and vocational education classes; and on the characteristics of the schools they attend.

Data from these sources are used in descriptive analyses that identify outcomes for youth with disabilities as a whole and those who differ in their primary disability classification. Multivariate explanatory analyses estimate the magnitude and direction of relationships<sup>1</sup> for numerous explanatory factors, statistically holding constant the other factors in the analysis. The factors included in these multivariate analyses are drawn from the NLTS2 conceptual framework and include youth, household, and school factors.

## How Are Youth with Disabilities Doing?

### School Engagement

NLTS2 analyses have addressed both the subjective dimension of engagement (e.g., the extent to which students enjoy school) and its behavioral dimension (e.g., absence from school, behaviors that suggest engagement in classroom activities). The results suggest that:

- Although most students with disabilities reportedly enjoy school, they are nevertheless somewhat less likely to enjoy school than their counterparts in the general population.
- On average, students with disabilities are absent about as frequently as those in the general population, but they are less likely to have perfect attendance.
- When they are at school, students' levels of engagement are related to class setting (i.e., general, special, or vocational education classroom). Specifically, students with disabilities are more likely to be rated "less engaged" and to be described as "rarely" participating in classroom discussions, completing homework on time, and staying focused on classwork in general education academic classes than in other settings. Furthermore, students with disabilities who spend time in all three settings are the least engaged when they are in general education academic classes.

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<sup>1</sup> Multivariate analyses identify relationships between a variety of factors and student outcomes, but findings do not imply that the factors cause the outcomes. For example, taking more courses in general education classes is positively associated with some measures of academic performance and social adjustment, independent of other differences between youth. However, this does not imply that general education settings cause better academic performance or social adjustment; rather, students may be in such settings in part because their academic abilities and behavior are appropriate for a general education classroom.

## Academic Performance

The national look at academic performance of secondary school students with disabilities that NLTS2 provides suggests that different indicators of performance offer divergent perspectives on the progress that some students are making.

- Most students with disabilities receive passing or even exemplary grades from their teachers, which could indicate successful accomplishment of curriculum goals.
- However, almost one-fourth of students with disabilities who take academic courses in general education classrooms are perceived by teachers as not keeping up with expectations in those classes.
- Further, significant numbers of students in all disability categories function sufficiently below grade level in reading and math so as to raise the question of their ability to complete high school work successfully.
- The correlation between grades and academic functioning is nearly zero, indicating that the two are largely unrelated. This finding is consistent with the perspective that teacher-given grades address more than content mastery and performance in the curriculum; they also reflect engagement and social factors.

## Social Adjustment

Findings in this chapter present a mixed picture of the social adjustment of youth with disabilities.

Many youth with disabilities are reported to be socially quite well adjusted.

- Between one-third and one-half are reported by parents “always” to exhibit a variety of social skills, and most other youth are reported to do so at least some of the time.
- The vast majority of youth also behave well in the classroom, reportedly getting along well with their teachers and other students and controlling their behavior well. Approximately three-quarters are reported to follow directions in the classroom well.
- Teachers report that approximately three-fourths of youth who have social integration goals or behavior management goals in their transition plans are making good progress toward meeting them.
- Most youth with disabilities also are socially integrated outside the classroom; approximately two-thirds belong to some type of organized group, and a similar percentage see friends at least once a week outside of school and organized group activities.

However, social adjustment challenges clearly remain for some youth.

- According to parents, approximately one in six youth with disabilities never seem confident in social situations. In addition, approximately 1 in 10 are reported never to make friends easily, start conversations, control their temper when arguing with peers, or avoid situations that are likely to result in trouble. One in six reportedly never end disagreements with their parents calmly, and one in five never join group activities without being told to do so.

- Approximately one in eight do not get along well with other students, and one in six do not control their behavior in the classroom well.
- According to school staff, one in four youth with disabilities who have transition goals related to improved social adjustment are not making much progress toward them.
- Overall, 16% of youth are reported by parents to have bullied other students in school, and 35% are reported to have been subject to some type of disciplinary action in school.
- Outside of school, one in six appear to be somewhat socially isolated, in that they do not belong to any type of organized group and see friends less than once a week.
- Approximately 13% of youth with disabilities have been arrested.

## **Independence**

NLTS2 has investigated a variety of factors affecting the emerging independence of youth with disabilities, including skills that support and strengthen self-determination, and responsibilities that accompany an independent lifestyle.

- Virtually all youth with disabilities have high self-care skills.
- About half of youth with disabilities have high functional cognitive skills, and only a small percentage do poorly in regard to these skills.
- About three-fourths of youth are reported to get around their neighborhoods “very well.”
- The self-determination skills involving persistence and asking for what one needs are demonstrated by more than half of youth with disabilities.
- About half of youth with disabilities usually prepare their own breakfasts and lunches, and a similar percentage shop on their own. Similar percentages are performing these tasks at least occasionally in the process of acquiring greater independence at home.
- Most youth have some experience managing their own money, but few have acquired the financial management skills required to manage checking accounts or credit cards.
- About one-third of age-eligible youth have acquired a driver’s license or permit.
- More than half of youth have been employed at some time during a 1-year period.

Clearly, many youth with disabilities are making progress toward achieving independence. This conclusion is confirmed by school personnel who report that youth have made the greatest progress on independent-living goals; their achievements toward goals of employment and self-advocacy are less notable.

## **Summing Up**

So what can be made of this diversity of experience? The answer depends in part on the yardstick by which outcomes are measured. The experiences of youth in the general population are one standard against which to assess those of youth with disabilities, yet using this standard does not give an unequivocal view of whether youth with disabilities are doing well or poorly. In the independence domain, for example, youth with disabilities have a 1-year employment rate that is essentially equivalent to that of youth in the general population. On the other hand, youth with disabilities have lower social skills than youth in the general population, which is a cause for concern. Poorer social skills may help explain why youth with disabilities have less active friendships than the general population of youth. Youth with disabilities also tend to like school

ES-4

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less than their nondisabled peers, although the two groups are about equally likely to be absent from school frequently.

Another standard against which one could assess the diversity of achievements of youth with disabilities is the experiences of a similar group in the past. The predecessor to NLTS2, the National Longitudinal Transition Study (NLTS), conducted from 1984 through 1993, provides an opportunity to compare outcomes reported for youth with disabilities now with outcomes for a similar cohort of youth at that time, a comparison that reveals both positive and cautionary results.

- In the independence domain, comparisons reveal modest, though statistically significant, declines in the ability to manage self-care needs and in functional cognitive skills. Yet the frequency with which youth with disabilities take on household responsibilities has not changed markedly over time, and there has been an increase in the rate at which youth with disabilities have their own money about which they can make decisions. Some of this increased responsibility for managing personal finances may result from a significantly higher rate of regular paid employment among youth with disabilities represented in NLTS2 than among those represented in NLTS. The clear advancement by youth with disabilities in holding regular paid jobs has closed the employment gap between youth with disabilities and the general population that existed in the past.
- At school, although absenteeism has increased significantly over time, grades also have increased, despite the fact that many more youth with disabilities spend more of their time in general education classrooms, with their typically higher grading standards relative to special education settings. However, the average gap of more than three grade levels between students' tested reading and math abilities and their actual grade levels has not declined over time.
- On the social adjustment front, the rate at which youth with disabilities belong to organized groups has remained stable over time. However, the frequency with which they experience negative consequences for their behavior, in terms of disciplinary actions at school, arrests, or being fired from a job, has increased.

## **What Makes a Difference?**

As depicted by a variety of outcome measures across multiple outcome domains, youth with disabilities experience the full range of possible experiences, from high achievement to significant struggles. What accounts for that variation in experience? Multivariate analyses suggest that characteristics of youth themselves and those of their households and their school programs and experiences all come into play in understanding the diversity of experiences of youth with disabilities.

### **Disability and Functioning**

**Disability characteristics.** Youth who are similar in other respects have the following kinds of differences in outcomes associated with the nature of their disability:

- Relative to youth with learning disabilities,<sup>2</sup> those with visual impairments experience lower absenteeism at school and higher reading and math abilities, but more negative independence outcomes in terms of employment. Having a visual impairment does not have an independent relationship to social involvement with groups or friends.
- Like youth with visual impairments, those with orthopedic impairments generally succeed at school, but they have less involvement with extracurricular groups and friends and less independence in terms of assuming household responsibilities and holding a job.
- Youth with emotional disturbances tend to be better readers than youth with learning disabilities, other factors held constant, and are equally likely to have active friendships and group memberships. However, they are much more likely to experience disciplinary actions at school and arrests in the community.
- The cognitive limitations of youth with mental retardation show up in their reading and mathematics skills, which are significantly farther behind grade level than those of others. However, grades are higher for youth mental retardation than those with learning disabilities, independent of other differences in functioning between youth, suggesting that differences in grading standards in general and special education settings may be inadequately controlled for in the analyses.
- Apart from other differences between youth in their disability, functioning, or other characteristics, having attention deficit or attention deficit/hyperactivity disorder (ADD/ADHD) as a primary or secondary disability is associated with poorer classroom engagement behaviors in special education settings, poorer grades, and a higher likelihood of disciplinary actions. However, youth whose parents report that they have ADD/ADHD are no more or less behind in reading or mathematics than youth with disabilities who do not, and they are more likely than others to belong to extracurricular groups and hold regular paid jobs.
- Dealing with the consequences of disability from an early age, rather than having it identified when youth are older, is related to better classroom engagement behaviors, better grades, and a lower likelihood of being subject to disciplinary actions.
- Having functional limitations in more areas (e.g., mobility, vision, communication) is associated with less absenteeism, better classroom engagement behaviors, more group memberships, and a lower likelihood of arrest. However, it also is associated with being significantly more behind in reading, having less active friendships, and being less independent both at home and in the pursuit of employment.

**Functioning.** NLTS2 analyses show that different kinds of skills relate differently across the outcome domains.

- Higher functional cognitive skills are strongly and positively related to better classroom engagement, higher academic achievement in both reading and math, having more active friendships, and greater independence in taking on household responsibilities. Yet youth

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<sup>2</sup> Multivariate analyses require that for categorical variables, such as disability category, each category be compared with another specified category. Learning disabilities was chosen as the category against which to compare the relationships for other disabilities because it is the largest disability category and, therefore, most closely resembles the characteristics of students with disabilities as a whole.



with higher functional cognitive skills also are more likely to get into trouble, both at school and in the community, independent of other differences among youth.

- Although poor self-care skills are associated with higher absenteeism and less engagement in group activities, household responsibilities, and employment, they have no relationship to academic achievement, independent of other differences between youth. In fact, youth with lower self-care skills tend to have better grades than youth who are more fully functioning in managing their self-care needs, even controlling for such differences as the percentage of classes taken in general education settings.
- Youth with higher social skills are significantly more likely to belong to groups, see friends regularly, and avoid arrest than youth with lower social skills, other factors held constant. They also are more likely to take on household responsibilities and hold regular paid jobs. At school they tend to have higher grades and more positive classroom engagement behaviors. However, they also are significantly farther behind grade level in reading than their socially less-skilled peers, reinforcing the notion that teacher-given grades reflect more than academic ability.
- Those rated as more persistent by parents also exhibit more engagement in classroom activities in all settings, receive better grades, and are less likely to experience disciplinary actions at school than less persistent peers, other things being equal. Persistent youth are more likely to take on household responsibilities, but they are less likely to see friends regularly. This trait does not relate to academic abilities in reading and math, apart from other differences between youth.
- Youth's general health is included in analyses of absenteeism, and it demonstrates the strongest relationship to that indicator of engagement of any factor, underscoring the fact that absenteeism from school can be both voluntary and involuntary.

### **Individual Demographic Characteristics**

**Age.** Older youth are more likely than younger peers to take on household responsibilities and work outside the home, independent of other differences between them. Older youth tend to be farther behind in their reading and math abilities. Further, older youth also are less likely to experience disciplinary actions than younger students with disabilities, other things being equal.

**Gender.** Independent of other differences, boys with disabilities have poorer classroom engagement behaviors and lower grades than girls, both factors that reflect teachers' judgments. Boys with disabilities also are farther behind grade level in reading, although they are less likely than girls to be behind in math. And boys are much more likely to be subject to disciplinary actions at school and to arrest in the community. They are less involved with household chores at home, which may reflect or contribute to the fact that boys also are more likely than girls with disabilities to see friends regularly outside of school or in organized group activities. Finally, the employment advantage once experienced by boys with disabilities relative to girls has disappeared.

**Race/ethnicity.** Compared with white youth with disabilities, both African-American and Hispanic youth are significantly farther behind grade level in both reading and math and are much less likely to have regular paid jobs. However, the outcome patterns of these two groups diverge in other areas. Relative to white youth with disabilities, African Americans demonstrate

lower classroom engagement, receive lower grades, and are more likely to be subject to disciplinary actions at school. In contrast, Hispanic youth with disabilities tend to get in trouble less at school and have classroom behaviors and grades that are not different from those of white youth. However, they do tend to be less likely to participate in organized group activities than white youth, independent of income and other differences between them.

**Primary language.** Independent of racial/ethnic differences among youth with disabilities, using a language other than English at home does not appear to relate to youth outcomes, with the exception that youth with disabilities who primarily use a language other than English at home are significantly farther behind grade level in reading than their peers—a skill that fundamentally involves language comprehension.

### **Household Characteristics**

The household context in which youth with disabilities live can be expected to help shape their experiences across outcome domains.

**Household income.** Youth with disabilities from lower-income households are more likely to be absent from school and less likely to demonstrate behaviors that indicate engagement in classroom activities than more affluent peers. Their academic performance also is poorer; they are farther behind grade level in reading and math, and are more likely to receive poor grades. Although they are more likely than wealthier peers to see friends regularly, youth from lower-income households are less likely to take part in organized group activities and are more subject to disciplinary actions at school and arrest in the community. Lower-income youth are more likely to be involved with household chores than wealthier youth, but do not differ from them in their likelihood of participating in the workforce.

**Family support for education.** Youth with disabilities whose families are more involved in their schools, as demonstrated by such activities as attending school meetings or classroom events or volunteering at school, are less far behind grade level in reading than youth with less family involvement at school. They also tend to have better grades and more active involvement in organized groups (many of which are at school) and with individual friendships. In the independence domain, they are more likely than youth from less involved families to have regular paid jobs. One exception is that greater support for education at home is negatively associated with grades, possibly because parents are more likely to provide homework help to students who are doing poorly in school.

**Family expectations for the future.** Other things being equal, youth with disabilities whose parents expect them to go on to postsecondary education after high school have more positive classroom engagement behaviors, get better grades, and are significantly closer to grade level in their reading and math abilities than youth who are not expected to further their educations after high school. They also are more likely to affiliate with organized groups, many of which may be sponsored by or meet at school. Similarly, in the independence domain, youth with disabilities whose parents have high expectations that they will live independently in the future are more likely to assume household responsibilities while in high school. No relationship is found between expectations for future employment and youth's employment during high school.

## School Programs

Although individual and household factors are strongly related to outcomes of youth with disabilities, schools can make a difference for youth, particularly in the areas in which they are the most active partners: school engagement and academic performance.

**Enrollment in general education courses.** Students with disabilities who take a wider range of their courses in general education classes tend to miss fewer days of school, are closer to grade level in their reading and math abilities, and are less likely to be subject to disciplinary actions, irrespective of other differences between them and students who take fewer general education courses. However, these positive findings must be balanced against indications that the general education classroom experience challenges the ability of many students with disabilities to succeed there, as reflected in the generally lower grades given by their teachers. Outside of class, however, students appear to accrue benefits in terms of a higher likelihood of engaging in extracurricular group activities at school or in the community and seeing friends regularly.

**Class size.** Youth with disabilities in larger classes tend to be closer to grade level in their reading and math abilities than students who are in smaller classes, irrespective of other differences between them, including the percentage of classes taken in general education settings.

**Vocational education, services, and experiences.** A variety of measures of vocational education, services, and experiences in high school generally are unrelated to outcomes across domains. Exceptions are that taking vocational education is related to lower absenteeism among students with disabilities, other differences between them held constant. In contrast, youth with disabilities who take part in a work experience program are less likely than others to hold a regular paid job outside of school, probably because of the time constraints posed by the work experience program.

**Other services, accommodations, and supports.** Results of NLTS2 multivariate analyses illustrate the difficulty of identifying benefits that may accrue from services, accommodations, or supports while youth are receiving them. Students with disabilities are provided services, accommodations, or supports because they are deemed unable to perform up to their potential without them. These limitations can be exhibited as negative outcomes, such as poor behavior or poor grades at school. Thus, when receipt of services or accommodations is measured at the same time as the outcomes that are the basis on which they qualify for them, a negative relationship between interventions and outcomes can occur. Some of these negative relationships are found in NLTS2 analyses. However, not all interventions are found to relate negatively to outcomes. For example, receiving help from a tutor is unrelated to grades or reading or math abilities, compared with students with disabilities who do not receive tutoring support. This finding suggests that tutors are helping students with disabilities keep up with peers who do not receive (and presumably do not need) tutoring.

## School-Related Experiences

NLTS2 analyses demonstrate that school experiences beyond courses, programs, and services are associated with students' outcomes both in and out of school.

**Absenteeism.** High absenteeism from school is related to teachers' perceptions of poor classroom behaviors in all classroom settings. Students who miss a good deal of school also are farther behind in both reading and math and receive poorer grades than students whose attendance is better. Increased involvement in disciplinary actions at school and with the criminal justice system also is associated with high absenteeism.

**School mobility.** Other factors held constant, youth with disabilities who have changed schools often, other than for natural grade progression, exhibit higher absenteeism than students whose school affiliations have been more stable. Although NLTS2 analyses show no direct relationship between high school mobility and indicators of academic performance, mobility is associated with a higher likelihood of both disciplinary actions and arrest.

**Declassification from special education.** Analyses of the relationships between students with disabilities being declassified from special education services and academic outcomes indicate that only students' grades are significantly associated with that experience.

**Grades and grade retention.** Youth with disabilities who have been held back one or more grades in their school careers are not less engaged in their school activities than other students, independent of other factors in the analyses. Neither does being retained relate independently to students' social adjustment. However, students who have been held back because of poor academic performance in the past continue to receive lower grades, other factors held constant. In turn, students who receive lower grades also are in trouble more, both in school and with the criminal justice system. They also are less likely to experience the socializing effects of group memberships but are more likely to see friends often outside of school or organized groups.

## **Clusters of Factors That Make a Difference**

This summary of multivariate analyses related to achievements of youth with disabilities suggests their independent relationships to many aspects of youth, their households, and their school programs and experiences, holding constant other factors. However, in real life, many of the factors discussed here are not independent; they cluster together for many youth, resulting in additive effects that distinguish youth to a greater extent than is revealed by looking at factors independently. For example, youth with emotional disturbances are more likely than youth in many other categories to be male, African American, and from lower-income households where they tend to receive less family support for education than many other youth. They also are likely to have had their disabilities identified well into elementary school, have relatively poor social skills, spend much of their school day in general education classes, and receive a variety of social adjustment supports. In contrast, youth with visual impairments as a group are comprised of a higher proportion of girls, students who are white, and those from higher-income households with positive expectations for the future. Like students with emotional disturbances, they also spend a high percentage of their school day in general education classes and receive accommodations and supports appropriate to their disability.

NLTS2 findings suggest that students with these two profiles have dramatically different prognoses for the future. For example, the probability of the boy with an emotional disturbance described above being subject to disciplinary action at school is 59 percentage points higher than for the girl with a visual impairment, and his likelihood of criminal justice system involvement is 42 percentage points higher. The boy with an emotional disturbance also is likely to miss 18

more days of school than the girl with a visual impairment, and there is a 12-percentage-point difference in the likelihood of these two hypothetical youth being employed in high school, favoring the boy with an emotional disturbance. These findings reinforce the importance of considering the entirety of a youth's characteristics, background, and experiences in developing the relationships, instructional methods, services, and supports that will best help them succeed.



# **1. ASSESSING THE ACHIEVEMENTS OF YOUTH WITH DISABILITIES DURING SECONDARY SCHOOL**

**By Mary Wagner**

Recent reforms in the American education system, codified in the *No Child Left Behind Act of 2001* (NCLB, P. L. 107-110), emphasize the accountability of schools, school districts, and states for the academic performance of all students. NCLB requires states to implement statewide accountability systems that are based on challenging academic standards in core areas, to test annually all students in grades 3 through 8, and to publish statewide progress objectives annually to ensure that all groups of students reach academic proficiency within 12 years of schooling.

This emphasis on improved academic performance is consistent with the intention of federal legislation that guides the provision of special education services for children and youth with disabilities—the Individuals with Disabilities Education Act Amendments of 1997 (IDEA '97). The act states that: “Improving educational results for children with disabilities is an essential element of our national policy of ensuring equality of opportunity, full participation, independent living, and economic self-sufficiency for individuals with disabilities” [Sec. 601(c)(1)]. Yet academic performance is not the ultimate outcome by which the education of youth with disabilities is to be assessed. The intention of the free appropriate public education guaranteed by IDEA to children and youth with disabilities is to “prepare them for employment and independent living” [Sec. 601(d)(1)(A)].

This purpose suggests the multidimensional nature of the achievements or outcomes desired for children and youth with disabilities. Yet specifying desired outcomes is only a first step toward an effective accountability system; only when data are available on how youth with disabilities fare across multiple outcome domains can America’s education system actually be accountable for the academic performance and postschool preparation of its students.

The Office of Special Education Programs (OSEP) of the U.S. Department of Education has commissioned a 10-year study that is generating the information needed to assess the achievements of youth with disabilities in their secondary school years in multiple domains. The National Longitudinal Transition Study-2 (NLTS2) is documenting the characteristics, experiences, and outcomes of a nationally representative sample of more than 11,000 youth who were ages 13 through 16 and were receiving special education services in grade 7 or above on December 1, 2000. (Demographic characteristics of youth with disabilities represented in NLTS2 and their households are described in Appendix C.) The NLTS2 findings generalize to youth with disabilities nationally, and to youth in each of the 12 federal special education disability categories in use for students in the NLTS2 age range.<sup>1</sup> (Details of the NLTS2 design, sample, and analysis procedures are found in Appendix A.)

This rich source of information will support a series of reports that will emerge over the life of NLTS2. This report considers the following questions for secondary-school-age youth with disabilities:

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<sup>1</sup> Additional information about NLTS2 is available at [www.nlts2.org](http://www.nlts2.org).

- What are the achievements of youth with disabilities in key outcome domains?
- How do achievements vary for youth with different kinds of disabilities?
- What individual, household, and school factors are related to more positive outcomes for youth with disabilities?

## Youth Outcomes

NLTS2 is able to address these questions with measures of outcomes that span multiple domains, including:

- **School engagement**—attending school and being actively engaged in learning activities there.
- **Academic performance**—mastering academic skills.
- **Social adjustment**—exhibiting social skills, being socially integrated, and avoiding negative behavior.
- **Independence**—demonstrating skills that support independence and assuming responsibilities at home and in the community.

Several sources of information have been used to measure outcomes in these domains and factors related to them:

- **Parents.** In telephone interviews conducted in 2001, parents reported on such topics as the activities of youth outside of school (e.g., getting together with friends, employment, criminal justice system involvement), youth's functioning (e.g., social skills, self-care skills), and household characteristics (e.g., income). Students were ages 13 through 17 at the time.
- **School staff best able to describe students' overall school programs and performance.** For each NLTS2 study member, school staff were asked to identify the person most knowledgeable about the overall school program of specific individual students; these persons often were special educators. A multipurpose survey was then conducted with those school staff in the 2001-02 school year, when students were ages 14 through 18.<sup>2</sup> One purpose was to obtain a snapshot of each student's school program in terms of the range of courses taken at the time and the setting for each of those courses. Information also was obtained on related services and supports and programs provided students, their transition planning experiences, and some aspects of their school performance (e.g., absenteeism, disciplinary actions, overall grades). In addition to this broad view of students' school programs, the survey collected information about instructional practices in both special education and vocational education classes.<sup>3</sup> Respondents were asked to report on the characteristics of specific classes (e.g., size, performance level) and instructional practices used with specific individual students in the class (e.g., curriculum used, frequency of using various instructional groupings and materials, grading criteria employed). For vocational education courses taken in general education classrooms, respondents were asked to report the extent to which the kinds of

<sup>2</sup> This survey is referred to as the student's school program survey.

<sup>3</sup> Respondents to the survey were instructed to collaborate with teachers of these classes, if needed, to provide information on instructional practices and other classroom experiences.



classroom practices used for students with disabilities differed from those used with the class as a whole.

- **Teachers of general education academic classes.** For NLTS2 study members who were reported by school staff to be enrolled in at least one general education academic class, teachers of the first such class in each student's school week were surveyed in the 2001-02 school year.<sup>4</sup> The first academic class in the week was selected so that information would be provided on a wide range of objectively selected classes taken by students with disabilities. As with special and vocational education courses addressed in the student's school program survey, general education academic teachers were asked to report background information on the class selected, the instructional practices used with specific individual students in the class, and how they work with the class as a whole. Teachers also reported on the supports they receive because the specific individual students are in their classes and on their perceptions of the appropriateness of those students' placements in their classes and students' performance in them.
- **School staff able to describe students' schools.** For each school attended by an NLTS2 study member, a school staff person who could report on the characteristics and policies of those schools (often the principal) was surveyed by mail to provide a school-level context for the classroom-level information collected in other surveys. Broad information about the school (e.g., grade levels served, whether public or private) as well as information about the student body (e.g., size, demographic characteristics, number of students receiving special education services, absenteeism and mobility rates) was collected. School policies that affect students with disabilities (e.g., inclusion of students with disabilities in content standards and mandated standardized testing, social promotion policies) also were addressed. For schools that serve 12th-grade students, information on rates of graduation, college entrance examination participation, and college enrollment was obtained. School-level information is linked to information for each NLTS2 study member enrolled at a given school.
- **School districts.** The primary disability classification and race/ethnicity of students were obtained from the school district rosters from which students were sampled.

These data sources produce information to measure the following indicators of outcomes within each domain.

### **School Engagement**

NLTS2 examines both the psychological and behavioral dimensions of school engagement for students with disabilities, including:

- **Students' liking school.** Students who have positive feelings about school are more likely than other students to attend school and participate fully in their educational experience. To measure youth's feelings about school, parents were asked to indicate on a 4-point scale their level of agreement with the statement "[Youth's name] enjoys school."
- **Absenteeism.** Absenteeism from school can be problematic for both students and teachers. Students miss exposure to instructional materials and activities, and frequent or prolonged absences may jeopardize their ability to keep up with their class. Having

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<sup>4</sup> This survey is referred to as the general education teacher survey.

students absent from school also requires that teachers repeat information and schedule makeup activities for absent students. Respondents to the school program survey reported the number of days youth were absent in February 2001. This value was multiplied by nine for the average days absent in a school year; the number of days students were absent due to suspensions or expulsions was then subtracted from this figure.

- **Engaging in classroom activities.** Although attendance is necessary for reaping the benefits of school, it is by no means sufficient. Students make the greatest gains when they work hard and consistently and when they participate actively in the learning enterprise. Teachers were asked to report how often students demonstrate they are engaged in classroom activities by doing the following: completing homework on time, taking part in group discussions, staying focused on classwork, and withdrawing from social contact or class activities. Responses were summed to create a scale that ranges from 4 (do all activities “rarely”) to 16 (do all activities “almost always”).

### **Academic Performance**

- **Grades.** Parents were asked to report students’ overall grades on a 9-point scale (mostly As, mostly As and Bs, mostly Bs, etc.). For youth with no parent interview, teachers were asked to report students’ grades in their classes on the same 9-point scale.<sup>5</sup>
- **Discrepancy between actual grade level and tested grade level in reading and mathematics.** Over time, students who do not learn effectively fall increasingly behind in their academic skills. To assess the extent to which youth with disabilities are keeping up with the academic performance expectations for their grade level, school staff were asked to report the most recent year in which the reading and mathematics abilities of students were tested and the grade-level equivalent of their abilities revealed by the tests. The tested grade level in the test year was then subtracted from each student’s actual grade level in that year. A negative number indicates that students’ abilities lag behind their actual grade level, and a positive number indicates that their abilities are more advanced than those typical for their grade level.
- **Teachers’ perceptions of performance.** In addition to the “hard” measures of grades and grade-level discrepancies, a more qualitative assessment of students’ academic performance is provided by teachers’ reports on two dimensions. School staff were asked to report on a 4-point scale the frequency with which each student with disabilities “works up to the best of his or her ability.” In addition, teachers of general education academic classes also were asked whether the students with disabilities in those classes were able to “keep up with the other students in the class.”

### **Social Adjustment**

- **Social skills.** Youth with disabilities differ markedly in their ability to relate to others (Cameto, Marder, Cadwallader, & Wagner, 2003), an ability that is facilitated by a variety of social skills that range from starting conversations readily and being comfortable in social situations to controlling one’s temper. The social skills of youth with disabilities were assessed by asking parents questions about the frequency with

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<sup>5</sup> Analyses of factors related to students’ grades include only students who receive these kinds of regular letter grades.

which youth exhibited nine aspects of social interactions, which were drawn from the Social Skills Rating System, Parent Form (Gresham & Elliott, 1990).<sup>6</sup> A summative scale for the items ranges from 9 (“never” exhibits any of the skills) to 27 (exhibits all of the skills “always”).

- **Classroom social behaviors.** To elicit information about youth’s classroom behavior from the schools’ point of view, NLTS2 asked teachers or school staff how well youth “get along with other students,” “follow directions,” and “control behavior to act appropriately in class.” Responses were summed to create a scale with values from 4 (all behaviors done “not at all well”) to 16 (all behaviors done “very well”). For each student, measures refer either to a general education academic class or a special education class, depending on the setting in which the student takes the most classes.
- **Getting along with teachers and students at school.** Parents were asked to report how well they thought youth get along with both teachers and other students at school; responses on a 4-point scale range from “very well” to “not at all well.”
- **Problem behaviors at school.** One problem behavior investigated in this outcome domain involves bullying other students. Parents of youth with disabilities were asked whether their son or daughter had bullied or picked on other youth at school during the current school year. In addition, school staff were asked whether during the current school year youth with disabilities had been suspended, expelled, or involved in any other type of disciplinary action, such as a referral to the office or detention.
- **Progress toward social adjustment goals.** Another benchmark against which to assess students’ achievements are the goals each student has as part of his or her transition plan. School staff were asked whether students with disabilities had each of several transition goals, two of which relate to social adjustment: “behavior management goals” and “social/interpersonal goals.” Those who responded that a student had such a goal were asked to report whether the student is making “a lot of progress,” “some progress,” “a little progress,” or “no progress.”
- **Social integration.** Parents reported on youth’s involvement with peers in organized extracurricular activities, as well as informal friendships. They indicated whether youth participated in any school activity outside of class, such as a sports team, band, or a school club, or in any out-of-school group activity, such as scouting, a church or temple youth group, or a nonschool sports team. Parents also were asked how many days a week their adolescent children with disabilities usually got together with friends outside of school and organized activities or groups.
- **Arrests.** Some youth with disabilities exhibit behaviors that so violate community norms that they become involved with the criminal justice system. To assess such behaviors, parents of youth with disabilities were asked whether their son or daughter had ever been arrested.

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<sup>6</sup> Please see Chapter 5 for the specific social skills included in this scale.

## Independence

### Skills That Support Independence

- **Managing self-care activities.** Although most youth who receive special education services have mastered the skills involved in such basic self-care functions as toileting and feeding themselves, these functions continue to challenge some youth. Parents' reports of the ability of youth to perform these functions constitute a self-care skills scale that ranges from 2 (performs the two tasks "not at all well") to 8 (performs both tasks "very well").
- **Functional cognitive skills.** Performing such functional skills as telling time, reading signs, counting change, and using the telephone presents challenges to many youth with disabilities, including those with cognitive impairments and some kinds of learning disabilities. Parents' reports on the ability of youth to perform these functions constitute a functional cognitive skills scale that ranges from 4 (performs all of the tasks "not at all well") to 16 (performs all tasks "very well"). These skills are referred to here as "functional cognitive skills" because they require the cognitive ability to read, count, and calculate. However, they also require sensory and motor skills (e.g., the ability to see signs, manipulate a telephone). Consequently, a high score indicates high functioning in all of these areas, but a low score can result from a deficit in the cognitive, sensory, and/or motor domains.
- **Mobility.** Getting around outside the home is an important marker of independence. The ability of youth to navigate the nearby environment outside their homes was assessed by using parents' ratings of how well youth were able to "get to places outside the home, like to school, to a nearby store or park, or to a neighbor's house." Because getting around independently can be especially problematic for youth with visual impairments, information on mobility skills was collected for all youth identified as having a visual impairment. School staff were asked to report how well youth with visual impairments are able to perform 10 mobility activities (e.g., travel indoors using rote learned routes, execute a route given a verbal set of directions). A composite mobility performance score ranging from 10 to 30 was calculated by summing these responses.
- **Self-determination.** The road to independence for adolescents also includes the development of self-determination skills, such as persisting with tasks to completion or knowing how and when to advocate for oneself. To assess persistence, parents were asked how often youth "keep working at something until he/she is finished, even if it takes a long time." Self-advocacy was assessed by using ratings by school staff of how well a student can "ask for what s/he needs in order to do his or her best in class." Responses range from "very well" to "not at all well."

### Transition Planning and Progress toward Goals

- **Participation of youth in transition planning.** Another potential indicator of emerging independence for youth with disabilities is their level of participation in planning their own transition from school to adulthood through the individualized education program (IEP) or individual transition plan (ITP) processes. Teaching students the skills to participate actively in the IEP process and providing opportunities to practice those skills facilitates stronger self-determination and lays the groundwork for continued self-

advocacy after leaving school, as youth negotiate their shifting role from student to adult (Stodden & Jones, 2002). School staff were asked to report the level of participation of students in transition planning, ranging from “This student has not attended planning meetings or participated in the transition planning process” to “This student has taken a leadership role in the transition planning process, helping set the direction of discussions, goals, and programs or service needs identified.”

- **Progress toward goals of independent living, employment, and self-advocacy.** School staff were asked whether students with disabilities had each of three transition goals that relate to future independence: “independent living goals (e.g., personal management, getting a driver’s license),” “vocationally oriented goals,” and “self-advocacy goals.” Those who responded that a student had such goals were asked to report whether the student is making “a lot of progress,” “some progress,” “a little progress,” or “no progress.”

### **Assuming Responsibilities of Daily Living**

- **Assuming personal responsibilities in the household.** As youth mature, they often are expected to become more responsible for their own support within the household, such as fixing their own breakfasts or lunches, straightening up their rooms or living areas, and doing their own laundry. In addition, most youth begin to function more independently outside the home (e.g., by shopping for personal items). Parents were asked how often youth fix their own breakfasts or lunches, straighten up their living spaces, do laundry, and buy a few things at a store when they are needed. Responses were summed to create a scale that ranges from 4 (does all activities “never”) to 16 (does all activities “always”).
- **Managing personal finances.** As they age, youth become increasingly able to and accountable for earning, spending, and saving money. To assess the extent to which youth with disabilities are acquiring these financial management responsibilities, parents were asked whether their adolescent children “get an allowance or have other money that he/she can decide how to spend.” They also were asked whether youth have savings accounts, checking accounts, or charge accounts or credit cards in their own names.

### **Emerging Independence in the Community**

- **Driving privileges.** This aspect of independence for youth with disabilities was assessed by asking parents of youth who were at least 15 years old whether their adolescent children with disabilities have a driver’s license or learner’s permit.
- **Regular paid employment.** Regular paid employment during high school has been found to be an important foundation for finding employment in the postschool years (Rothstein & Manser, 2000; Wehman, Kregel, & Barcus, 1985). Parents were asked to report whether in the preceding year youth had done “any work for pay, other than work around the house (or a school-sponsored job).”

## **Analysis Methods**

A two-pronged analysis approach has been used to address the research questions related to youth outcomes. The first step is to present descriptive findings for the indicators within each outcome domain for youth with disabilities as a whole. When possible, outcomes also are

compared with those for the general population of youth. The relationships among the indicators within an outcome domain then are considered to provide a deeper understanding of the multiple dimensions of outcomes within each domain. The descriptive analysis concludes by examining outcomes for youth who differ in their primary disability classification.

Analyses then address factors that are related to differences in selected outcomes. Multivariate analysis techniques (i.e., linear and logistic regression) are used to identify the independent relationships of various factors to outcomes. Such analyses estimate the magnitude and direction of relationships for numerous explanatory factors, statistically holding constant the other factors in the analysis.<sup>7</sup> The factors included in these multivariate analyses are drawn from the NLTS2 conceptual framework and are described in Chapter 2. Youth, household, and school factors are included in the analyses simultaneously, to identify the independent effects of each, controlling for all others.

Where relevant and appropriate, findings from NLTS2 are compared with those of the original National Longitudinal Transition Study (NLTS), conducted for OSEP from 1984 through 1993.

Readers should remember the following issues when interpreting the findings in this report:

- **Weighting of descriptive results.** All descriptive statistics presented in this report are weighted estimates of the national population of students receiving special education in the NLTS2 age group, as well as each disability category individually.
- **Standard errors.** For each mean and percentage in this report, a standard error is presented (usually in parentheses) 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., 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 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; Appendix D reports group sizes). Groups with very small samples have comparatively large standard errors. For example, because there are relatively few youth with deaf-blindness, estimates for that group have relatively large standard errors. Therefore, readers should be cautious in interpreting results for this group and others with small sample sizes.

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<sup>7</sup> Multivariate analyses identify relationships between a variety of factors and student outcomes, but findings do not imply that the factors cause the outcomes. For example, taking more courses in general education classes is positively associated with some measures of academic performance and social adjustment, independent of other differences between youth. However, this does not imply that general education settings cause better academic performance or social adjustment; rather, students may be in such settings in part because their academic abilities and behavior are appropriate for a general education classroom.

- **Significant differences.** In discussions of the descriptive statistics, only differences among groups that reach a level of statistical significance of  $p < .05$  are mentioned in the text, with significance levels generally noted. Appendix A outlines a method for using standard errors to calculate the significance of differences among groups of interest. Multivariate analysis results indicate statistically significant results with the use of asterisks.

## Organization of the Report

Chapter 2 presents the NLTS2 conceptual framework and the factors that it suggests may relate to the achievements of youth with disabilities. Chapters 3 through 6 present the results of the descriptive and multivariate analyses for the four outcome domains identified above. Chapter 7, the final chapter, identifies key lessons learned about the achievements of youth with disabilities and the individual, household, and school factors that are associated with more positive outcomes in their secondary school years. Appendix A provides details of the NLTS2 design, sample, measures, and analysis approaches, including definitions of the disability categories. Appendix B reports analyses of relationships between school-level factors and youth achievements, which were conducted independently of the multivariate analyses reported in Chapters 3 through 6. Appendix C provides descriptive information on the demographic characteristics of youth with disabilities and their households, as background for understanding the variations in their experiences and outcomes reported in this document. Appendix D provides unweighted group sizes for the analyses reported in the descriptive data tables.

The following chapters provide the most recent national picture of the multiple dimensions of the achievements of youth with disabilities in their secondary school years and of factors that are associated with those achievements. These findings will be augmented in the next few years of NLTS2 as youth transition to early adulthood and as NLTS2 reports focus on their experiences with postsecondary education, employment, and independent living.





## 2. FACTORS EXPECTED TO RELATE TO ACHIEVEMENTS OF YOUTH WITH DISABILITIES

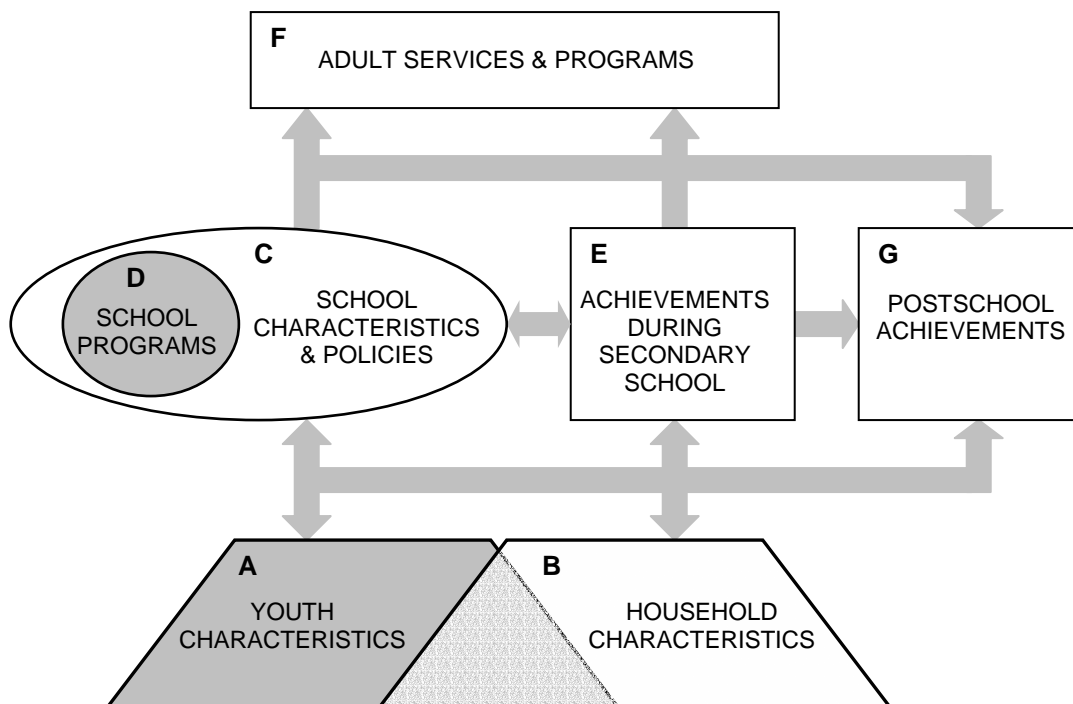
By Mary Wagner

The achievements of youth with disabilities during secondary school are the result of a complex interplay of many factors over time. Some are intrinsic to youth themselves; some are characteristics of their family environment; and some involve experiences in and outside of school. The importance of a particular factor and the ways such factors intertwine may differ for achievements in different domains. This chapter presents the factors that are expected to relate to achievements of youth with disabilities in one or more of the outcome domains outlined in Chapter 1.

### The NLTS2 Conceptual Framework

A conceptual framework is an organizational tool for specifying the primary elements involved in a particular phenomenon and the relationships among them. In the case of NLTS2, the conceptual framework identifies the elements related to the achievements of youth with disabilities during secondary school and in the early postschool years (Exhibit 2-1), as suggested by professional practice and previous research.

**Exhibit 2-1**  
**NLTS2 CONCEPTUAL FRAMEWORK**



The focus of this report—achievements of youth with disabilities during secondary school—is depicted as component E of the framework. Fundamental to understanding variations in achievements are the characteristics of youth themselves (component A), including those related to their disability, functioning, and demographics. Component B recognizes the importance of the household and family environment in helping shape the achievements of youth both in and outside of school. The specific programs of instruction and services provided individual youth with disabilities (component D) also are crucial to understanding variations in youth’s achievements.<sup>1</sup> The factors within these components and the expected relationships to outcomes that led to their inclusion in the analyses are described below.

## Individual Youth Characteristics

The outcomes identified in Chapter 1 occur through dynamic processes in which youth with disabilities are active participants. For example, the learning that promotes academic achievement occurs as teachers and students interact with each other and with instructional content and activities. Holding a job involves youth’s contributing their skills and labor to tasks defined by employers and often engaged in jointly with other employees. What youth bring to these processes are important elements in their success. Three major types of individual characteristics are hypothesized in NLTS2 to relate to the achievements of youth with disabilities in multiple domains: disability characteristics, functioning, and demographics.

### Disability Characteristics

In considering the variations in the achievements of youth in their secondary school years, it is important to understand the impact of disability, as related to:

- **Disability category.** The nature of a particular youth’s disability can powerfully condition his or her experiences, which may, in fact, be more like the experiences of youth who have no labeled disability than they are like the experiences of youth with a different kind of disability. Dichotomous variables are included in analyses that distinguish youth according to the federally defined special education disability categories in use for secondary-school-age students (please see Appendix A, Exhibit A-7).<sup>2</sup>

The assignment of youth to a disability category is based on the primary disability designated by the youth’s school or district in the 2000-01 school year. Although there are federal guidelines regarding making disability category assignments, criteria and methods for assigning students to categories vary widely. Therefore, NLTS2 category designations should be interpreted as describing those reported to have a particular disability, rather than those who have that disability.

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<sup>1</sup> NLTS2 analyses also investigated the independent relationships between school context factors (component C) and youth outcomes. Please see Appendix B for a discussion of this analysis and its results.

<sup>2</sup> For analysis purposes, the deaf-blind category was combined with the multiple disability category. In multivariate analyses, dichotomous variables such as these statistically contrast the effects of being in a category that is included in the analyses with being in a comparison category. Learning disability is the comparison category in NLTS2 multivariate analyses because it is the largest category and, therefore, most closely represents the experiences of students with disabilities as a whole.

Almost two-thirds of students receiving special education in the NLTS2 age group are classified as having a learning disability (62%). Youth with mental retardation and emotional disturbances make up 12% and 11% of students, respectively. Another 5% of youth are classified as having other health impairments, and 4% are identified as having speech impairments. The seven remaining disability categories each account for 1% or fewer of students and, together, make up about 5% of youth with disabilities. The nature of a youth's disability is hypothesized to account for much of the variation in achievements, with youth in such categories as learning disability and speech impairment generally experiencing more positive outcomes than, for example, youth in categories such as multiple disabilities or mental retardation.

- **Attention deficit disorder/attention deficit hyperactivity disorder (ADD/ADHD).** Although ADD/ADHD is not a separately designated disability category under IDEA '97, the behaviors that often characterize the disorder—distractability, poor impulse control, excess energy—can have a negative impact on the ability of youth to succeed academically and socially (Forehand, Wierson, Frame, Kempton, & Armistead, 1991; Reeve, 1994; Zentall, 1993). Thus, having ADD/ADHD is expected to exert its own influence on achievements of youth with disabilities, independent of the effects of being in a specific primary disability category. According to parents' reports, 36% of youth with disabilities receiving special education services in secondary school have been diagnosed with ADD/ADHD, including 76% of those in the other health impairment category, the category in which youth with ADD/ADHD as a primary disability generally are included. However, ADD/ADHD also is a secondary disability for many youth in other disability categories, including 63% of those with emotional disturbances and 32% of those with learning disabilities (Wagner, Marder, & Cardoso, 2003).
- **Age at identification of disability.** Early identification of a disability indicates that it affects functioning early in the developmental process, whereas later identification suggests that some degree of development occurred without the potentially limiting effects of disability. Thus, on average, youth whose disabilities were identified at an earlier age are expected to have greater challenges to achievement. Parents reported the age at which youth first exhibited a physical, learning, or other disability or problem for which they eventually were diagnosed. Although the average age is 5.7 years, approximately one in five youth have disabilities that first were diagnosed when they were infants or toddlers, and another 11% have disabilities or delays that were identified in their preschool years. School entry, at age 5 or 6, was when almost one-third of youth first had their disabilities identified, whereas 19% did not have their disabilities identified until they were at least 9 years old (Wagner, Marder, et al., 2003).
- **Number of domains influenced by disability.** The number of functional domains affected by disability indicates the breadth of the potential impact of disability on the outcomes youth may achieve. To assess the breadth of the functional impacts of youth's disabilities, parents were asked to report whether youth experience limitations in six areas: general health; vision; use of arms, hands, legs, and feet; speech production; understanding of speech; and participation in bidirectional communication. Parents of youth with disabilities report that half have problems in at least one area, whereas 8% have problems in four or more of these areas (Wagner, Blackorby, Marder, & Levine, 2003).

## Functioning

NLTS2 findings demonstrate the considerable variation in skills across several dimensions among youth who share a primary disability category designation (Cameto et al., 2003; Wagner, Blackorby, et al., 2003). Prior research for NLTS also showed that differences in functional abilities strongly relate to youth outcomes across multiple domains (D’Amico, 1991; Newman, 1991; Wagner, 1991a). Hence, NLTS2 analyses include variables that distinguish the level of functioning of youth with disabilities in the areas noted below. Although each of these measures is an indicator within an outcome domain, as described in Chapter 1, they have not been chosen for multivariate analyses. Instead, they are used as independent variables in explaining variation in other outcomes across domains.<sup>3</sup>

- **Self-care skills.** Higher self-care abilities are expected to relate to higher achievement in outcome domains for which physical functioning is particularly important (e.g., independence), but to have little relationship to achievements in other domains (e.g., academic engagement or performance).
- **Functional cognitive skills.** As an indicator of the ability to process information that is important to daily functioning, higher functional cognitive skills are expected to relate strongly to better outcomes across the outcome domains.
- **Social skills.** The ability to interact effectively with others is crucial to success at school, at home, and in the community. Hence, higher social skills are expected to relate to higher achievement across the outcome domains, with particular relevance to social adjustment.
- **Self-determination skills.** The ability to persist with tasks to completion is expected to be positively associated with other aspects of independence, as well as with higher levels of school engagement and academic achievement.
- **Students’ general health.** Students who are in poor health may find it difficult to attend school. For example, the Centers for Disease Control and Prevention (2003) estimate that from 1994 to 1996, 14 million school days were missed because of asthma—the most common long-term childhood disease, which affects 6.3 million children. For this reason, parents’ reports of the general health of youth with disabilities are included in the analysis of absenteeism. Parents report that youth with disabilities are about as healthy as youth in the general population, with 70% reported to be in excellent or very good health and 8% in fair or poor health (Wagner, Blackorby, et al., 2003).

## Demographic Characteristics

The factors noted above suggest that the nature of a youth’s disability can be a powerful influence on his or her experiences. However, especially during adolescence, other fundamental characteristics also help shape achievements. At this time of life, a single year of age can make a major difference in both competence and independence. Gender is a defining human characteristic at any age, and during adolescence, when youth are exploring their sexuality and gender roles, it can shape their experiences and choices in powerful ways. Race/ethnicity and language background can be associated with rich cultural traditions, patterns of relationships

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<sup>3</sup> Values for the skills scales are reported in the chapters dealing with the outcome domains to which they pertain.

within families and communities, and strong group identification. All of these factors can generate important differences in values, perspectives, expectations, and practices.

- **Age.** Youth with disabilities in NLTS2 were ages 13 through 17 when interview data were collected from parents and ages 14 through 18 when survey data were collected from their schools. Because this is a fairly narrow age range, the differences in some outcomes for youth who are at the lower and upper ends of the range were expected to be small. However, the independence domain is an exception, with older youth expected to acquire more experience in such aspects of independence as employment (D'Amico, 1991) and household responsibilities. Because the age distribution of youth differs across disability categories (e.g., youth with speech impairments tend to be younger, on average, than other groups) (Marder, Levine, & Wagner, 2003), multivariate analyses are required to disentangle the effects of age from those of disability.
- **Gender.** In the general population, differences in the achievements of young men and of young women both in school and in the workplace are notable (National Center for Education Statistics, 2002). Important differences have been noted for youth with disabilities regarding aspects of academics (Wagner, 1992), independence (D'Amico, 1991), and social adjustment (Newman, 1991; Wagner, Cadwallader, & Marder, 2003). Whereas youth in the general population are split about evenly between boys and girls, almost two-thirds of youth with disabilities in the NLTS2 age range are boys. Further, it also is clear that gender is intertwined with the nature of youth's disabilities, with males accounting for a much higher proportion of some disability categories (e.g., autism, emotional disturbances) than others (e.g., hearing or visual impairments) (Marder, Levine, & Wagner, 2003). Including both gender and disability in multivariate analyses will enable their independent relationships to outcomes to be identified.
- **Racial/ethnic background.** Research has documented the relative disadvantage minority youth experience in education and employment domains (National Center for Education Statistics, 2002), as has prior research on youth with disabilities (D'Amico, 1991; Wagner, 1991a, 1991b). A similar pattern was expected to emerge in the analyses reported in subsequent chapters. Overall, 62% of youth with disabilities are white, 21% are African American, 14% are Hispanic, and 3% have other or multiple racial/ethnic backgrounds. However, this distribution varies across disability categories, with the categories of mental retardation, emotional disturbance, and autism having particularly large percentages of African Americans and particularly small percentages of Hispanic students (Marder, Levine, & Wagner, 2003). Again, multivariate analyses permit the relationships of these factors to outcomes for youth with disabilities to be assessed independently.

## Household Characteristics

Although the variables described above were expected to do much to help illuminate important differences in the experiences of youth with disabilities, focusing on these variables alone would mistakenly imply that youth outcomes are determined solely by somewhat immutable characteristics that young people bring with them to school, and would ignore the important role of household and family context in shaping the experiences of youth. The

following characteristics of the households of youth with disabilities were expected to relate to their achievements in the ways noted below.

- **Household income.** Poverty has been shown to have serious negative consequences for children and youth as a whole (Duncan & Brooks-Gunn, 1997) and for the achievements of youth with disabilities in secondary school (Newman, 1991; Wagner, 1991a) and beyond (Wagner, Blackorby, Cameto, & Newman, 1993). A similar pattern was expected for NLTS2 analyses. One-fourth of youth with disabilities live in poverty, a higher rate than in the general population (Marder, Levine, Wagner, & Cardoso, 2003). However, the incomes of families of youth with disabilities range widely, with 19% living in households with annual incomes of \$15,000 or less and 13% living in households with incomes of more than \$75,000. Because poverty is often characteristic of the households of children and youth of color, including both household income and the racial/ethnic background of youth with disabilities in analyses will help disentangle their interrelationships.
- **Family support for education.** Parental support for learning is an important contributor to success in school for the general student population (Epstein, 1987, 1996; Henderson & Berla, 1994; Thorkildsen & Stein, 1998). Positive outcomes associated with family involvement in and support for education include better grades (Clark, 1983), more consistent attendance (National Middle School Association, 2000) and homework completion (Epstein, Simon, & Salinas, 1997), and more positive behavior (Epstein, 1987). Similar associations were expected for youth with disabilities. Two scales have been constructed to test this expectation. One scale, which assesses family involvement in education at home, is the frequency (on a 4-point scale) with which parents report helping youth with homework and talking with youth, and, a dichotomous variable indicating whether the family provides a computer at home that the student uses for educational purposes; summing responses to these items produces a scale ranging from 0 to 9, with a mean of 6.8. Family involvement at school is assessed with a second scale constructed by summing parents' reports (on a 4-point scale) of the frequency with which they did the following in the 2001-02 school year: "attend a general school meeting, for example back-to-school night or the meeting of a parent-teacher organization"; "attend a school or class event, such as a play, sports event, or science fair"; or "volunteer at school, for example, chaperoning a class field trip or serving on a committee." The scale ranges from 0 to 12, with a mean of 3.3.
- **Family expectations.** Research has demonstrated that having clear, consistent, and high expectations for academic performance plays a key role in student achievement for the general population (Thorkildsen & Stein, 1998). Similar relationships have been found for students with disabilities (Wagner, Blackorby, Cameto, and Newman, 1993) and were expected to emerge in NLTS2 analyses. Parents were asked to report their expectations that their adolescent children with disabilities will "get a regular high school diploma," "attend school after high school," "live away from home on his/her own without supervision," and "get a paid job." Expectations for youth are generally high. Overall, 85% of parents expect youth "definitely" or "probably" to get a regular high school diploma, 62% to attend postsecondary school, 85% to live independently, and 97% to get a paid job.

## School Programs and Experiences

School programs, support services, and other experiences can and do help shape youth's achievements, particularly in the domains of academic engagement and performance. Some aspects of students' school programs were expected to influence their achievements in a variety of domains. For example, spending a greater part of the school day in general education classes exposes students with disabilities both to more challenging content than many special education classes offer and to opportunities to interact with peers without disabilities. These experiences were expected to enhance the academic engagement and performance of students with disabilities, as well as their social integration. In contrast, taking life skills training was expected to increase the independence of youth but not to be related markedly to achievements in other domains. Thus, the specific aspects of students' school programs and services that are included in analyses of particular outcome domains are those that relate most directly to those domains, as discussed below.

### Course Taking

- **Extent of participation in general education classes.** Including students with disabilities in general education classrooms has been shown to benefit both students with disabilities (Baker, Wang, & Walberg, 1994; Waldron, 1997) and general education students (Stainback & Stainback, 1996; Staub & Peck, 1994; Waldron, 1997). Thus, a measure of the level of involvement of students with disabilities is included in analyses of school engagement, academic performance, and social adjustment. School staff reported an overview of the settings in which students with disabilities take 11 kinds of courses, enabling a calculation of the percentage of the types of courses students with disabilities take that are in general education classes, which has a mean of 60%. This aspect of students' school programs is expected to have a somewhat complex relationship to academic performance. For example, exposure to the more challenging content in general education classes, relative to many special education classes, is expected to better enable students with disabilities in general education classes to acquire the skills appropriate to their grade level. On the other hand, the more challenging content and, often, different grading standards in general education classes may be reflected in poorer grade performance relative to peers in special education classrooms. In fact, analyses for NLTS demonstrated that spending a greater proportion of the school day in general education classes relates to higher rates of course failure for youth with disabilities (Wagner, 1991a). Similar differences in the direction of relationship could be evident in the social adjustment domain. Although spending a greater part of the school day with peers without disabilities has been shown to be associated with greater involvement with friends or organized groups (Newman, 1991), different standards for the appropriateness of behavior in general vs. special education classes could result in a higher incidence of disciplinary actions for students with disabilities in general education classes than for those taking more classes in special education settings.
- **Participation in vocational education.** Taking vocational education has been demonstrated to relate to better school engagement (Wagner 1991a) and higher rates of school completion (Wagner, 1991b) for youth with disabilities. Along with participation in work experience programs, vocational education also relates to a higher likelihood of

employment when youth with disabilities leave high school (D'Amico, 1991). Similar relationships were expected for NLTS2. As part of the course-taking overview provided in the NLTS2 student's school program survey, school staff indicated whether each student was taking a prevocational or occupational vocational education program at the time of the survey; 70% of students with disabilities are reported to be taking one or more vocational education courses that semester. In addition, school staff indicated whether the student's school program included school- or community-based work experience activities; 19% of students with disabilities had such experience as part of their school programs.

- **Average class size.** Both the content of courses taken by youth with disabilities and the context within which those courses are taken potentially relate to their outcomes. One important aspect of that context is class size. In the general education arena, many states, as well as the federal government, have launched initiatives to reduce class sizes at various grade levels in the belief that teachers teach and students learn better when classes are smaller, both for students in the general population (Addonizio & Phelps, 2000; Finn, Gerber, Achilles, & Boyd-Zaharias, 2001; McLaughlin & Drori, 2000; Mitchell & Mitchell, 2001) and for students with disabilities (Bulgren et al., 2002). NLTS2 asked school staff to report the number of general and special education students in each student's general education academic, vocational education, and special education class (or any of those classes taken by the student). For students who take classes in both general education and special education settings, the setting in which he or she spends the most time was used to select the class size value to use in analyses. If those items were missing but class size had been reported for a vocational education class, that measure was used. Across settings, class size averages 15.4 students.

### **Services, Accommodations, and Supports**

It is important to understand the relationships between the outcomes of youth with disabilities and the kinds of services, accommodations, and supports they are provided to help improve those outcomes. To that end, a variety of measures of these factors are included in analyses. However, interpreting the relationships that result can be problematic. Although these kinds of supports were expected to benefit students who receive them, receiving them often is conditioned on students' exhibiting difficulty in the relevant outcome domain. Students in academic difficulty receive tutoring assistance; those exhibiting behaviors that are problematic for themselves and others may have behavior management plans. Thus, it is extremely difficult to disentangle the effects of receiving services and supports from the factors that indicate need for them in the first place when both are measured at a single point in time. Longitudinal analyses in subsequent waves of NLTS2 will enable a clearer look at the effects of receiving services, accommodations, and supports at one point in time on later outcomes. Nonetheless, current analyses explore the relationships between relevant outcomes and the following:

- **Tutoring.** Because tutoring has been shown to have beneficial effects on students' academic performance and behavior (DuPaul, Ervin, Hook, & McGoey, 1998; Franklin, Griffin, & Perry, 1995; Longwill & Kleinert, 1993), analyses of students' academic performance include exploration of relationships to students' receiving help from an adult or peer tutor, as indicated by school staff or parents. Although receiving such help would be expected to relate to better academic performance for the students who need it, the



confounding of need with service receipt, mentioned above, makes expectations regarding the direction of the relationship unclear. Overall, one-third of students with disabilities are reported to receive help from a tutor.

- **Receiving social adjustment support services.** The Individuals with Disabilities Education Act Amendments of 1997 (IDEA '97) require teams that plan a student's individualized education program (IEP) to consider, if appropriate, strategies to address behavior that impedes a student's learning or that of others [Sec. 614(d)(3)(B)(i)]. An IEP or behavioral intervention plan could call for a variety of behavioral supports or programs that have been shown to improve behavior (Sprague, 1995; Sprague et al., 2001). In analyses of social adjustment outcomes, relationships with a variety of such supports, services, and programs are explored. These services and programs and the percentage of youth receiving them include: mental health services (20%), social work services (12%), a behavior management plan (13%), an anger management or conflict resolution program (27%), substance abuse education or treatment (39%), and services from a behavioral interventionist (13%). In some analyses, the sum of these services and supports is included; it ranges from 0 to 6, with a mean of 1.1.
- **Receiving instructional accommodations or modifications.** Research has demonstrated the positive impacts of accommodations on the academic performance of students with disabilities, as indicated by test scores for secondary school students with disabilities (Calhoun, Fuchs, & Hamlett, 2000; Camara, Copeland, & Rothschild, 1998; Huynh, Meyer, & Gallant-Taylor, 2002). Thus, an indicator of receipt of such accommodations is included in NLTS2 analyses of academic performance. School staff indicated whether youth received the following: being given more time to take tests, having tests read to the student, taking modified tests, taking alternative assessments, having modified grading standards, receiving slower-paced instruction, being given more time to complete assignments, being given shorter or different assignments, or receiving help with learning strategies or study assistance. A scale of the extensiveness of such support was constructed by summing the number of supports provided each student. The scale ranges from 0 to 9, with a mean of 3.3.
- **Receiving communication or presentation accommodations or modifications.** In addition to instructional and/or testing accommodations, school staff indicated whether youth received each of the following accommodations related to communication or presentation of information: help from a reader or interpreter, use of books on tape, use of a calculator or a computer when other students were not allowed to use one, communication aids (e.g., Touch Talker), and computer hardware or software designed for students with disabilities. A scale of the extensiveness of such support was constructed by summing the number provided each student. The scale ranges from 0 to 7, with a mean of .7.
- **Receiving vocational services.** A variety of support services (e.g., job coaching, technical-preparation programs, job readiness training) can be provided students with disabilities to assist them in achieving vocationally oriented goals, with research suggesting benefits accruing to some students from some kinds of supports (Bang & Lamb, 1997; Bragg, 2002; Farris & Stancliffe, 2001; Flowers, 2000; Lee, Storey, Anderson, Goetz, & Zivolich, 1997). Receipt of each of 12 vocational support services

was reported by respondents to the student's school program survey.<sup>4</sup> The number of such services each student receives was calculated by summing item values, which results in a range from 0 to 12, with a mean of 2.1.

### Other School Experiences

In addition to the courses, settings, and services and supports that characterize the school programs of youth with disabilities, other current and past school-related experiences are expected to relate to student outcomes, particularly in the domains of school engagement and academic performance, including the following:

- **Student mobility.** Research has demonstrated relationships between high rates of student mobility and poor school performance and frequent behavioral problems (Demie, 2002; Rumberger, 2002; Simpson & Fowler, 1994; Wood, Halfon, Scarlata, Newacheck, & Nessim, 1993). These negative consequences of student mobility may result, at least in part, from the disruption and lack of continuity in students' learning experiences, which, for students with disabilities, may include compromised service coordination, the potential for poor communication between new and old schools and service systems, and inadequate record sharing (Kerbow, 1996). For these reasons, parents' reports of the number of times students with disabilities have changed schools, other than because they were moving from one grade level to the next, are included in analyses of school engagement, academic performance, and social adjustment.
- **Grades.** Because links have been identified between the academic performance and social behavior of students (Center for Mental Health in Schools, 2000; Fad & Ryser, 1993; Gresham & MacMillan, 1997; Gunter, Denny, & Venn, 2000), a measure of students' grades is included in analyses of social adjustment. Although the measure of grades that is used as a dependent measure (described in Chapter 1) includes only students who receive regular letter grades, the measure used as an independent variable is defined more broadly so that it also includes students who receive such grades as "excellent," "good," "fair," and "poor"; grades in this form were converted to correspond to the same scale as letter grades.<sup>5</sup>
- **Declassification.** Students with disabilities who meet their IEP goals or who otherwise are found no longer to need special education services are declassified from those services and return to the status of other students without disabilities. As an indication that specially designed instruction is no longer required to meet the unique needs of the student, the experience of declassification is expected to relate to more positive academic performance. NLTS2 data indicate that, according to school staff, in a 1-year period, about 4% of secondary-school-age students with disabilities are declassified from special education.<sup>6</sup>

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<sup>4</sup> Please see Appendix A for a list of these supports.

<sup>5</sup> Please see Appendix A for a description of the meshing of grade measures.

<sup>6</sup> Although some students are declassified from special education services each year and thus no longer are considered to have a disability for educational purposes, all youth continue to be referred to in NLTS2 as "youth with disabilities." Regardless of their participation in special education services, all youth selected for NLTS2 continue to be considered part of the study.

- **Absenteeism.** Because absenteeism results in students' missing exposure to curriculum and instruction and may interfere with relationships and behavior within the classroom, the number of days students are absent in a month, excluding suspensions and expulsions, is included in analyses of academic performance, classroom engagement, and social adjustment.
- **Grade retention.** The intention in making low-performing students repeat a grade is to provide an opportunity for them to master material missed in their first exposure to it at a given grade level. Although public policy is shifting against the practice of "social promotion" of underachieving students, research on the effects of grade retention provides little consistent evidence that it benefits students academically (Holmes, 1989); to the contrary, grade retention is linked to higher rates of dropping out of school (Roderick, Nagaoka, Bacon, & Easton, 2000) and poor social adjustment and employment outcomes after high school (Jimerson, 1999). NLTS2 analyses include a measure of parents' reports of whether youth have ever been retained at grade level in analyses of school engagement, academic performance, and social adjustment.

The following chapters report the relationships among the wide array of characteristics of individual youth with disabilities, their households, and their school programs and experiences with outcomes in the school engagement, academic performance, social adjustment, and independence domains.



### **3. SCHOOL ENGAGEMENT OF YOUTH WITH DISABILITIES**

**By Lynn Newman, Elizabeth Davies, and Camille Marder**

Policy-makers, educators, and researchers agree that students who participate actively in and enjoy school are more likely to experience educational success (Herman & Tucker, 2000; Hudley, Daoud, Hershberg, Wright-Castro, & Polanco, 2002; Newmann, 1992; Singh, Granville, & Dika, 2002; Sirin & Jackson, 2001). This chapter examines the engagement in or “connection” to the school experience of secondary school students with disabilities.

The extent to which students participate in their educational experiences can have critical and lasting implications. Low or inadequate engagement in school has been identified as a strong predictor of academic failure (Donahoe & Zigmond, 1990; Hudley et al., 2002; Schellenberg, Frye, & Tomsic, 1988; Wagner et al., 1991). Moreover, the association between engagement at school and academic achievement appears to be independent of the effects of other student characteristics, such as gender, race/ethnicity, or socioeconomic status (Finn, 1993). Low achievement, in turn, is a precursor to dropping out (Redd, Brooks, & McGarvey, 2001). Students need reasons to be enthusiastic about and dedicated to school, particularly over the secondary school years, when dropping out becomes problematic.

Students who show little engagement in their education often have fewer positive experiences in the classroom than other students. For example, students who have frequent school absences necessarily lose opportunities to participate fully in their education. Likewise, those who struggle to meet academic or behavioral expectations while in the classroom may experience repeated embarrassment or failure, which in turn may lead to diminished satisfaction and interest in school.

Many students with disabilities have characteristics and experiences that put them at risk for disengagement from school. Students with disabilities may miss more school than other students because of factors associated with their disability. Teachers may have lower expectations for them than for other students, resulting in their receiving fewer opportunities and less encouragement to participate in stimulating or challenging classroom activities (Goodenow, 1992; Grossman, 2002). Some have disabilities that may make it difficult to sustain attention to school tasks.

Fortunately, unlike some other student characteristics (e.g., demographics or disability category), a student’s level of engagement at school can be modified by external influences, such as teachers’ behaviors, the school climate, and attitudes of parents and peers (Finn, 1993; King, Vidourek, Davis, & McClellan, 2002; Marks, 2000; Naffziger, Steele, & Varner, 1998; Tucker et al., 2002). Students who are made to feel welcome at school and who are given opportunities and encouraged to excel may be fully engaged, despite academic disadvantages.

Agreement is widespread that much can be gained from promoting students’ engagement at school, but studies have shown little consensus in defining engagement. Some have focused on students’ overt behaviors that indicate engagement, such as attending school regularly and completing homework, whereas others consider students’ emotional experience of school. Current thinking suggests that engagement at school is a multidimensional construct, having emotional or subjective as well as behavioral components (Finn, 1993; Sirin & Jackson, 2001).

This chapter examines both the subjective and behavioral dimensions of school engagement for students with disabilities, including:

- Feelings about school
- School attendance
- Classroom engagement behaviors.

School engagement is described in regard to these dimensions for youth with disabilities as a group and for those who differ in their primary disability category. Then, two indicators receive more in-depth analysis: school attendance and classroom engagement behaviors.

## Dimensions of School Engagement

### The Subjective Dimension of School Engagement

The subjective or emotional dimension of engagement at school reflects the extent to which a student identifies with the school environment (Finn, 1993; Hudley et al., 2002). Students who have positive feelings about school are more likely than other students to attend school and participate fully in their educational experience.

To measure the feelings of youth with disabilities about school, parents were asked to indicate their level of agreement with the statement, “[Youth’s name] enjoys school.” Although almost three-quarters (73%) of their parents agree or strongly agree with the statement, approximately one in four youth are reported not to enjoy school (Exhibit 3-1).

<b>Exhibit 3-1 ENGAGEMENT AT SCHOOL OF YOUTH WITH DISABILITIES</b>		
	Number/ Percentage	Standard Error
Percentage of students whose parents agree with the statement “[Youth] enjoys school”		
Strongly agree	21.9	1.3
Agree	51.0	1.6
Disagree/strongly disagree	27.0	1.4
Absenteeism		
Mean number of days absent in 4 weeks	2.6	.2
Percentage absent 6 or more days in 4 weeks	13.7	1.5
Source: National Longitudinal Transition Study-2 (NLTS2) Wave 1 parent interview and student’s school program survey.		

School appears to be somewhat less enjoyable for students with disabilities than for students in the general population, at least as perceived by their parents. In a national sample of adults with children in the 6th through 12th grades, 86% of parents agreed or strongly agreed that their child enjoys school (Chandler, Nolin, & Zill, 1993). Students in middle or junior high school were as likely to be reported as enjoying school as were senior high school students.

### The Behavioral Dimension of School Engagement

At least in part reflecting their feelings about school, students also demonstrate

their school engagement by their behaviors. The behavioral aspect of student engagement relates to a student’s overt participation in his or her education (Finn, 1993; Sirin & Jackson, 2001). This aspect includes attending school and the behaviors that students exhibit while in the classroom.

**Attendance.** School attendance is the most basic indicator of being engaged, and, for some students, absenteeism represents disengagement from their education. Missing days of school means missing coursework that is often difficult to make up. Students who are frequently absent also lose access to teachers and peers who can promote positive attitudes about and approaches to learning. High absenteeism has been identified as perhaps the single strongest predictor of academic failure and dropout decisions for students with disabilities (Blackorby & Wagner, 1996; Donahoe & Zigmond, 1990; Schellenberg et al., 1988; Thurlow, Sinclair, & Johnson, 2002; Wagner et al., 1991).

On average, students with disabilities miss 2.6 days of school in a 4-week period, excluding suspensions and expulsions. This number translates to 23.4 days during a school year, or about a full month of school. This average masks considerable variation. Overall, 34% of students with disabilities miss no school at all in a 4-week period, whereas almost 14% miss more than 5 days. Four percent are absent 10 or more days, missing more than half of their classes.

Figures for 13- to 17-year olds in the general population are not available, so a full comparison cannot be made. However, national figures for 8th and 10th graders suggest that students with disabilities are more likely than their nondisabled peers to miss some school. Specifically, 68% of eighth-grade students with disabilities are absent at least 1 day in a 4-week period, compared with 55% of eighth-grade students in the general population (National Center for Education Statistics, 2002). Figures are similar for 10th graders. On the other hand, youth with disabilities are not more likely than their peers in the general population to miss a large number of days of school. Among youth with disabilities, 10% of both 8th and 10th graders are reported to be absent more than 5 days in a 4-week period, whereas among youth in the general population 13% of 8th graders and 14% of 10th graders are reported to be absent that frequently (National Center for Education Statistics, 2002).

**Classroom engagement behaviors.** Attending school does not guarantee that students are engaged in their coursework. Although attendance is necessary for reaping the benefits of school, it is by no means sufficient. Students make the greatest gains when they work hard and consistently, and when they engage actively in the learning enterprise in the classroom.

To measure students' classroom engagement behaviors, teachers were asked to report how often youth:

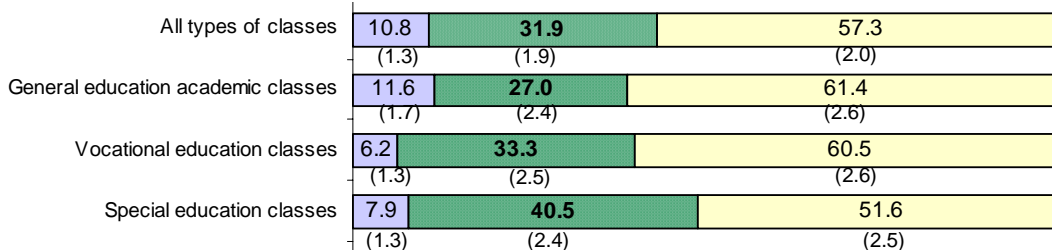
- Take part in group discussions
- Complete homework on time
- Stay focused on classwork
- Withdraw from social contact or class activities.

Teachers responded on a 4-point scale, ranging from "rarely" to "almost always."

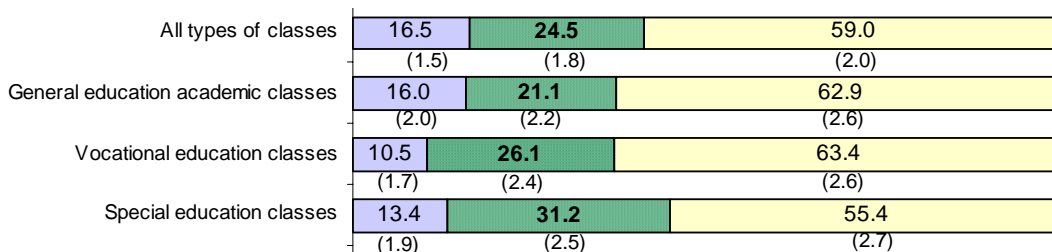
According to teachers, almost 60% of students with disabilities usually or almost always stay focused in their classwork, and a similar percentage tend to complete their homework on time (Exhibit 3-2). Approximately 1 in 10 youth rarely stay focused on classwork, and 1 in 6 rarely complete their homework on time.

### Exhibit 3-2 CLASSROOM ENGAGEMENT BEHAVIORS OF YOUTH WITH DISABILITIES, BY CLASS SETTING

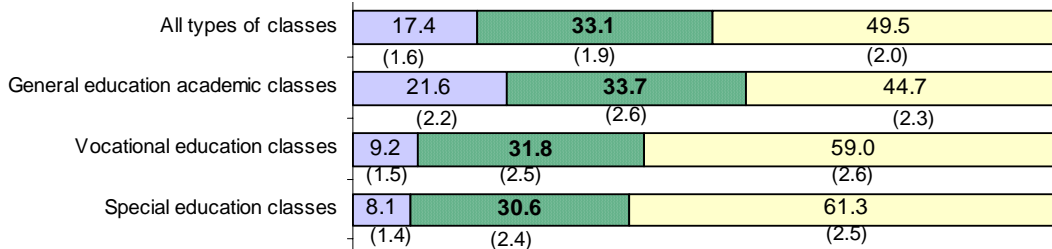
#### Percentage who Stay focused on classwork



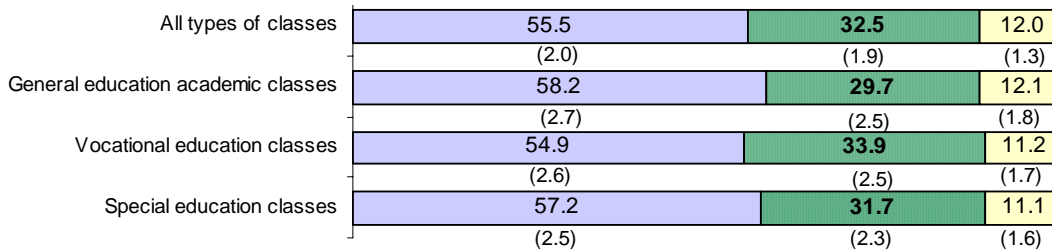
#### Complete homework on time



#### Participate in group discussions



#### Withdraw from social contact



■ Rarely      ■ Sometimes      ■ Usually or almost always

Source: NLTS2 Wave 1 student's school program survey.  
Standard errors are in parentheses.

Note: Percentages for "all types of classes" are calculated by using the type of class in which the student spends the most time. Percentages for each type of class are calculated for all students with each type of class, regardless of whether they have the other two types of classes. Thus, a student with classes in all three types of settings is included in analyses of general education academic classes, vocational education classes, and special education classes.



Taking part in class discussions appears to be more challenging than staying focused on classwork or completing homework for youth with disabilities. Although about half usually or almost always participate in class discussions and a similar percentage rarely withdraw from social contact, 17% rarely participate in class discussions and 12% usually or almost always withdraw from social contact.

Some aspects of youth's behaviors differ in general education academic classes, vocational education classes, and special education classes.<sup>1</sup> Students are less likely to stay focused on their classwork in special education than in general education settings; 52% usually or almost always do so in special education classes, compared with 61% and 60% in general and vocational education academic classes, respectively ( $p<.05$ ). They also are less likely to complete their homework on time (55% vs. 63% usually or almost always do so,  $p<.05$ ). On the other hand, students are more likely to take part in class discussions in special education settings than in general education settings. In special education settings, 61% usually or almost always take part in such discussions and 8% rarely take part in them, whereas in general education settings, 45% usually or almost always take part in discussions ( $p<.001$ ) and 22% rarely participate in them ( $p<.001$ ). There are no differences across settings in the extent to which students withdraw from social contact in class.

Students in vocational education classes behave similarly to students in special education classes in terms of their taking part in class discussions, but similarly to students in general education classes in terms of staying focused or completing homework on time.

These findings raise the question whether differences in behaviors across class settings are related to differences in the students who take classes in those settings or to influences of class settings on behavior. To explore this issue, behaviors in the three settings were compared for the subset of students who take classes in all of them. The findings for this subset of students are very similar to the findings reported in Exhibit 3-2. Thus, the differences across settings shown in Exhibit 3-2 cannot be attributed to differences in the groups of students in each type of setting. Instead, they appear to relate to aspects of the class setting, such as class size, comfort with the teacher or other students in the class, or the teacher's expectations for behavior.

**Classroom engagement scale.** To examine overall classroom behavior in each type of setting, a scale was created by summing the ratings on the four behaviors. The scale ranges from 4 (all behaviors given the least positive rating) to 16 (all behaviors given the most positive rating). Scale scores are grouped as low engagement (scores of 4 to 8), moderate engagement (scores of 9 to 14), and high engagement (scores of 15 or 16).

Although mean scale scores do not differ by class setting, some differences are found at the two extremes (Exhibit 3-3). In general education classes, students are more likely than in vocational or special education settings to receive a score indicating low engagement (19% vs.

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<sup>1</sup> Overall, 69% of students with disabilities take at least one general education academic class, 70% take at least one subject in a special education setting, and 68% take a vocational education class. Approximately 85% of students take classes in more than one setting. In Exhibit 3-2, percentages for "all types of classes" are calculated by using the type of class in which the student spends the most time. Percentages for the three types of classes are calculated for the students in each type of class, regardless of whether they have the other two types of classes. Thus, a student with classes in all three types of settings is included in analyses of general education academic classes, vocational education classes, and special education classes.

11% and 13%,  $p < .01$  and  $p < .05$ ). In addition, in special education classes, students are more likely than in vocational classes to be rated as highly engaged (20% vs. 14%,  $p < .05$ ).

**Exhibit 3-3**  
**CLASSROOM ENGAGEMENT SCALE**  
**SCORES OF YOUTH WITH DISABILITIES,**  
**BY CLASS SETTING**

	General Education Academic Class	Vocational Education Class	Special Education Class
Percentage less engaged (scores of 4 to 8)	18.9 (2.2)	10.9 (1.7)	13.3 (1.9)
Percentage highly engaged (scores of 15 or 16)	18.2 (2.1)	14.1 (1.9)	20.4 (2.2)
Mean scores	11.4 (.2)	11.6 (.1)	11.7 (.2)

Source: NLTS2 Wave 1 teacher and student's school program surveys.

Standard errors are in parentheses.

**Relationships among Dimensions of School Engagement**

For students with disabilities, enjoyment of school is associated with fewer absences ( $r = -.09$ ,  $p < .0001$ ) and positive classroom behaviors ( $r = .1$ ,  $p < .0001$ ). Higher absenteeism also is associated with poorer classroom behaviors that indicate engagement ( $r = -.16$ ,  $p < .0001$ ). These relationships differ little across the three types of class setting.

**Disability Differences in School Engagement**

School engagement differs markedly across disability categories (Exhibit 3-5). On nearly all measures, students with emotional disturbances are less engaged than their peers with other kinds of disabilities. For example, they are the least likely to have positive feelings about school; 42% of their parents indicate that they do not enjoy school, compared with one-third or fewer of students in other categories ( $p < .05$  to  $p < .001$ ). The fact that students with emotional disturbances are less likely than other students to enjoy school may explain in part why they are

**Exhibit 3-4**  
**CORRELATIONS AMONG INDICATORS OF**  
**SCHOOL ENGAGEMENT OF YOUTH WITH**  
**DISABILITIES**

	Youth Enjoys School	Classroom Behavior Scale
Absences excluding suspensions	-.09 ( $p < .0001$ )	-.16 ( $p < .0001$ )
Youth enjoys school		.18 ( $p < .0001$ )

Source: NLTS2 Wave 1 teacher and student's school program surveys.

Standard errors are in parentheses.

less likely to attend school regularly. Students with emotional disturbances have the highest absenteeism from school—an average of 3.1 days in 4 weeks. Of these students, 16% miss 6 or more days of school in 4 weeks—more than students in every other disability category except traumatic brain injury and multiple disabilities ( $p < .05$  to  $.001$  across categories).

Generally, when they are in school, students with emotional disturbances tend not to be active participants. Consistently across the class settings, a substantial minority of these students are considered to have low engagement—30% in general education academic classes, 22% in vocational education classes, and 27% in special education classes. Moreover, fewer than 10% are considered highly engaged in any of the three classroom settings.

### Exhibit 3-5

#### SCHOOL ENGAGEMENT OF YOUTH WITH DISABILITIES, BY DISABILITY CATEGORY

	Learning Disability	Speech/Language Impairment	Mental Retardation	Emotional Disturbance	Hearing Impairment	Visual Impairment	Orthopedic Impairment	Other Health Impairment	Autism	Traumatic Brain Injury	Multiple Disabilities	Deaf-Blindness
<b>Enjoyment of school</b>												
Percentage of students whose parents agree that "[Youth] enjoys school" <sup>a</sup>												
Strongly agree	20.1 (2.0)	25.3 (2.2)	32.3 (2.4)	13.2 (1.8)	31.6 (2.7)	31.9 (3.3)	33.9 (2.6)	19.6 (1.9)	34.3 (2.6)	21.2 (3.7)	40.4 (2.7)	44.7 (5.2)
Disagree/strongly disagree	27.7 (2.2)	18.0 (1.9)	17.2 (1.9)	41.8 (2.6)	12.5 (1.9)	12.9 (2.4)	14.8 (2.0)	34.1 (2.3)	14.5 (1.9)	27.7 (4.1)	11.7 (1.8)	15.0 (3.8)
<b>Absenteeism</b>												
Average days absent in 4 weeks	2.7 (.3)	1.9 (.2)	2.2 (.2)	3.1 (.4)	1.8 (.3)	1.4 (.3)	2.0 (.2)	2.0 (.2)	1.3 (.2)	2.7 (.5)	2.7 (.3)	1.8 (.4)
Percentage absent 6 or more days in 4 weeks	14.9 (2.4)	7.5 (1.9)	10.5 (2.1)	16.0 (3.2)	7.8 (2.3)	3.2 (1.8)	9.3 (2.1)	10.7 (2.1)	6.0 (1.6)	16.0 (4.6)	16.0 (2.9)	9.6 (3.8)
<b>Classroom behavior</b>												
Mean scores:												
General education academic class	11.6 (.2)	11.9 (.2)	10.2 (.4)	10.4 (.3)	12.5 (.3)	12.7 (.4)	12.2 (.2)	10.9 (.2)	11.4 (.4)	11.9 (.5)	12.2 (.5)	--
Vocational education class	12.0 (.2)	12.0 (.2)	11.0 (.2)	10.5 (.3)	12.5 (.3)	13.1 (.5)	12.4 (.3)	11.3 (.2)	9.8 (.3)	11.7 (.4)	10.7 (.3)	11.8 (.5)
Special education class	12.0 (.2)	12.0 (.3)	11.6 (.2)	10.3 (.3)	12.5 (.3)	12.5 (.6)	12.0 (.3)	11.5 (.2)	10.6 (.3)	12.1 (.5)	11.2 (.3)	12.2 (.7)
Percentage with high classroom engagement scale scores (15 or 16) in:												
General education academic classes	20.2 (3.0)	20.7 (3.1)	6.4 (3.8)	9.9 (3.7)	30.4 (4.5)	34.8 (6.3)	22.8 (3.6)	13.1 (2.5)	18.1 (5.0)	23.6 (7.0)	22.7 (8.2)	--
Vocational education classes	16.1 (3.1)	16.9 (3.6)	9.2 (2.3)	6.4 (2.8)	27.0 (4.6)	39.1 (7.9)	25.1 (4.1)	11.5 (2.8)	8.0 (2.5)	12.6 (5.6)	7.0 (2.6)	16.7 (6.3)
Special education classes	24.2 (3.6)	20.3 (4.1)	16.4 (3.0)	7.2 (2.7)	30.0 (5.7)	29.7 (8.5)	25.7 (4.1)	15.1 (3.0)	10.5 (3.0)	28.7 (7.2)	10.9 (3.5)	29.5 (11.7)
Percentage with low classroom engagement scale scores (4 to 8) in:												
General education academic classes	16.9 (2.8)	14.0 (2.6)	27.1 (6.9)	29.9 (5.7)	13.2 (3.3)	9.9 (3.9)	13.8 (3.0)	23.4 (3.1)	14.7 (4.6)	13.7 (5.7)	14.0 (6.8)	--
Vocational education classes	7.5 (2.2)	7.7 (2.5)	16.3 (2.9)	21.9 (4.8)	7.9 (2.8)	6.9 (4.1)	7.6 (2.5)	12.7 (2.9)	34.4 (4.4)	8.5 (4.7)	23.6 (4.4)	12.4 (5.6)
Special education classes	10.4 (2.6)	8.4 (2.8)	16.1 (2.9)	26.6 (4.6)	6.0 (2.9)	12.6 (6.2)	10.8 (2.9)	13.0 (2.8)	25.4 (4.3)	12.8 (5.3)	17.7 (4.3)	8.0 (6.9)

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

<sup>a</sup> The category "agree" is omitted from the exhibit.

-- Too few to report separately.

Standard errors are in parentheses.

Students with mental retardation or other health impairments also tend to be less engaged in school than many of their peers in other disability categories. Their average classroom engagement scores are lower than many of their peers' scores across the class settings, and about one-third of students with other health impairments are reported not to like school.

In contrast, students with hearing or visual impairments are among the most engaged at school. Approximately 90% of these students have parents who indicate that they enjoy school. They are absent fewer days than many of their peers in other disability categories (1.8 and 1.4 days, respectively) and are more likely than others to be rated as highly engaged across the class settings, ranging from 27% to 30% for those with hearing impairments and 30% to 39% for those with visual impairments. Youth with orthopedic impairments also have relatively high engagement, as indicated by the large percentage reported to enjoy school (85%) and relatively small percentages receiving low classroom behavior scores (8% to 14% across behaviors). Youth with hearing, visual, or orthopedic impairments are the only groups to have average classroom engagement scale scores above 12 across all three settings.

The pattern of a larger percentage of students with disabilities scoring low on the classroom engagement scale in general education academic classes than in other kinds of classes holds true for 9 of the 12 disability categories; for 7 of those categories, vocational education classes have the fewest low scorers, as is true for students with disabilities overall. Similarly, the pattern observed for high scorers for students overall—with a smaller proportion scoring high on classroom engagement in vocational than in special education classes—holds true for 11 categories. The relatively small differences across settings in mean scores on the classroom engagement scale (.3) observed for students with disabilities as a whole also pertains to most categories. However, significant variation occurs across settings in average scale scores for youth with mental retardation, autism, and multiple disabilities (1.4 to 1.6,  $p < .01$  and  $p < .05$ ).

## **Factors Associated with School Engagement**

Thus far, this chapter has described the school engagement of youth with disabilities as a group and for youth in each disability category. But such analyses do not provide information about the associations of a host of other factors with school engagement or about the associations of the various types of disabilities with school engagement when other factors are held constant. For example, there are more males among youth with emotional disturbances than among youth with visual impairments, so the extent to which the differences presented in Exhibit 3-4 are associated with differences in gender, not disability, is unclear.

Multivariate regression analyses were conducted to explore the associations of many characteristics of youth, their families, and their school programs and experiences with absenteeism and classroom engagement scale scores in general education academic, vocational education, and special education settings. Results from these analyses illuminate the association of each variable with the outcome, controlling for all other variables.

### **Individual Characteristics**

Individual characteristics include those associated with the disabilities of youth, their functioning, and their demographics (Exhibit 3-6).

**Exhibit 3-6**  
**DIFFERENCES IN SCHOOL ENGAGEMENT ASSOCIATED WITH**  
**INDIVIDUAL CHARACTERISTICS OF YOUTH WITH DISABILITIES<sup>a</sup>**

Estimated Difference In:					
	Average Number of Days Absent per Year	General Education Academic Classroom Engagement Scale Score	Vocational Education Classroom Engagement Scale Score	Special Education Classroom Engagement Scale Score	For Increment
<b>Disability characteristics</b>					
Youth classified with:					
Speech/language impairment	-6	<b>-5*</b>	<b>-7*</b>	<b>-8**</b>	vs. learning disability <sup>b</sup>
Mental retardation	-4.4	-.2	-.4	<b>-6*</b>	vs. learning disability
Emotional disturbance	-.2	-.3	<b>-.9**</b>	<b>-.7*</b>	vs. learning disability
Hearing impairment	-4.2	-.0	.3	-.3	vs. learning disability
Visual impairment	<b>-8.2**</b>	.4	.1	-.2	vs. learning disability
Orthopedic impairment	-1.5	-.4	-.0	<b>-.6*</b>	vs. learning disability
Other health impairment	-4.2	<b>-.9***</b>	<b>-.8**</b>	<b>-1.1***</b>	vs. learning disability
Autism	<b>-7.8**</b>	-.3	<b>-1.7***</b>	<b>-1.7***</b>	vs. learning disability
Traumatic brain injury	1.9	.4	-.1	.0	vs. learning disability
Multiple disabilities/deaf-blindness	-2.7	-.1	-.3	<b>-.6*</b>	vs. learning disability
ADD/ADHD <sup>c</sup>	-.4	-.3	-.2	<b>-.3*</b>	Yes vs. no
Age at identification	.4	.0	-.1	<b>-.2*</b>	8 years vs. 4 years
Number of problem domains	<b>-2.2**</b>	.0	-.0	-.1	Three vs. one
<b>Functioning</b>					
General health status	<b>-10.6***</b>				Excellent vs. poor (5 vs. 1)
Self-care skills	<b>-4.4*</b>	<b>-.8*</b>	<b>1.0***</b>	.4	High vs. low (8 vs. 4)
Functional cognitive skills	1.1	.3	<b>.5**</b>	.3	High vs. low (15 vs. 7)
Social skills	-.2	<b>.5*</b>	<b>.7***</b>	<b>.5**</b>	High vs. low (27 vs. 17)
Persistence	2.1	<b>1.1***</b>	<b>.6***</b>	<b>.5**</b>	Very often keeps at tasks vs. rarely (3 vs. 1)
<b>Demographics</b>					
Age	.6	-.2	-.0	.1	17 vs. 14
Gender	<b>-2.9**</b>	<b>-.6***</b>	<b>-.6***</b>	<b>-.5***</b>	Male vs. female
African American	-.2	<b>-.5*</b>	-.3	<b>-.3*</b>	vs. white
Hispanic	2.3	-.5	-.3	-.2	vs. white
Other or multiple race/ethnicity	<b>7.9**</b>	-.2	-.6	-.1	vs. white
Primarily language other than English spoken at home	-2.0	.2	.2	.1	Yes vs. no

<sup>a</sup>Statistics in this exhibit are calculated from models that included all individual characteristics, as well as household characteristics (results shown in Exhibit 3-7) and school programs and experiences (results shown in Exhibit 3-8).

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

<sup>c</sup>ADD/ADHD is included to determine its relationships as a primary or secondary disability to school engagement, independent of youth's primary disability category.

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

Exhibit reads: In a school year, youth with visual impairments are absent 8.2 days less than youth with learning disabilities, other factors in Exhibits 3-6 through 3-8 being equal. In a school year, youth with a high self-care skills score are absent 4.4 days less than youth with a low self-care skills score, other factors being equal.

**Disability characteristics.** These findings confirm some of the descriptive analyses presented earlier in the chapter regarding disability category differences in school engagement. For example, there are few significant differences in absenteeism associated with disability category, with the exceptions that absenteeism is about 8 days lower for students with visual impairments or autism than for the comparison condition (students with learning disabilities), and students with limitations in a greater number of functional domains have lower absenteeism than those less broadly affected by disability. Also mirroring the bivariate analyses, students with autism are less likely to be engaged in their classes, receiving lower vocational and special education classroom engagement scores than their peers with learning disabilities.

However, unlike bivariate analyses, in which the greatest range in classroom engagement scores is apparent for vocational education classes, in multivariate analyses that control for other factors, disability differences are most apparent in students' engagement in their special education classes. Students in all but three categories (hearing and visual impairment and traumatic brain injury) receive lower special education classroom engagement scale scores than do their peers with learning disabilities, other things being equal. Moreover, in special education classes, ADD/ADHD is related to lower classroom engagement scores; a similar relationship is noted for youth who were older when they were first identified as having a disability.

**Functioning.** Although voluntary absenteeism from school is often considered an indicator of alienation from school (e.g., Finn, 1989; Hudley et al, 2002), clearly not all absenteeism is voluntary. Students with disabilities often are absent from school because of illnesses or overall poor health. Holding other differences constant, students whose parents report their health as being "excellent" miss an estimated 11 fewer days of school in a school year than those whose health is rated as "poor."

Students' self-care skills are related to their school engagement, but not in a consistent direction. Those with higher self-care skills scores miss fewer days of school and receive higher engagement score ratings in their vocational education classes, but receive lower class engagement ratings in their general education academic classes. Controlling for other factors, self-care skills are not related to differences in special education classroom engagement scores. Functional cognitive skills appear to be related only to engagement in vocational classes; those with higher cognitive skills receive higher vocational classroom engagement scores, other factors being equal.

Having stronger social skills is consistently related to higher levels of engagement in all types of classes, although it does not appear to be related to rates of absenteeism when other differences among students are held constant. The relationship between social skills and class-level engagement is not surprising, given that two of the aspects of classroom engagement are taking part in group discussions and not withdrawing from social contact or class activities.

Persistence also is related highly to classroom engagement across all class settings. This relationship is expected in that two components of the classroom engagement scale are completing homework on time and staying focused on classwork—activities that require persistence.

**Demographic characteristics.** Age differences are unrelated to students' school engagement. However, both absenteeism and classroom behaviors are related to gender, although in opposite directions. Independent of differences in disability and other factors, boys

miss 3 fewer days of school per year than girls, but girls receive higher classroom engagement scale scores than boys in all three settings.

Controlling for other factors, racial/ethnic background is related to only a few aspects of school engagement. African-American students with disabilities receive lower classroom behavior ratings in general education academic and special education classes than white students. Further, students who are Asian, Native American, or of multiple or “other” racial/ethnic backgrounds miss 8 more days of school per year than their white peers.

### Household Characteristics

Household income is related only to differences in absenteeism, with youth from wealthier families less likely to be absent (Exhibit 3-7). No differences are found in classroom engagement scores related to household income when other factors are taken into account. Family involvement at home or at school is not related to most aspects of engagement, with the exception that students whose families are more highly involved at home are more likely to be rated as engaged in vocational class activities than are those whose families are less involved at home. An aspect of the classroom engagement scale is completing homework on time, and one facet of family involvement at home is frequency of helping with homework. It is possible that this additional homework support is related to more successful homework completion for students in vocational classes.

In contrast to the absence of consistent relationships between family involvement and school engagement, families’ expectation that their adolescent children with disabilities will continue their education past high school is highly related to classroom engagement across settings. Students who are expected “definitely” to attend postsecondary school receive higher classroom engagement ratings in all types of classes than their peers who are not expected to continue their education, with the largest difference noted for general education academic classes.

**Exhibit 3-7**  
**DIFFERENCES IN SCHOOL ENGAGEMENT ASSOCIATED WITH HOUSEHOLD CHARACTERISTICS OF YOUTH WITH DISABILITIES<sup>a</sup>**

	Average Number of Days Absent per Year	Estimated Difference In:			For Increment
		General Education Academic Classroom Engagement Scale Score	Vocational Education Classroom Engagement Scale Score	Special Education Class Behavior Scale Score	
Household income	<b>-2.2**</b>	.2	.0	-.1	\$55,000 to \$60,000 vs. \$20,000 to \$24,000 (12 vs. 5)
Family involvement at home	-.9	-.2	<b>.3*</b>	.1	High vs. low (8 vs. 4)
Family involvement at school	.3	-.0	-.1	-.0	High vs. low (6 vs. 1)
Family expectations for postsecondary attendance	-1.6	<b>1.0***</b>	<b>.6***</b>	<b>.5***</b>	Definitely will vs. probably won't (4 vs. 2)

<sup>a</sup>Statistics in this exhibit are calculated from models that included all household characteristics, as well as individual characteristics (results shown in Exhibit 3-6) and school programs and experiences (results shown in Exhibit 3-8).

\*p<.10; \*\*p<.05; \*\*\*p<.01; \*\*\*\*p<.001.

Exhibit reads: In a school year, youth whose household incomes are between \$55,000 and \$60,000 are absent 2.2 days less than youth whose family incomes are between \$20,000 and \$24,000, all other variables being equal.

## **School Programs and Experiences**

**School program factors.** Several aspects of the school programs of youth with disabilities are related to their school engagement (Exhibit 3-8). Holding constant all other individual and household characteristics shown in Exhibits 3-6 and 3-7 (including type of disability and levels of functioning), both greater inclusion in general education academic classes and taking one or more vocational education courses are related to lower average absenteeism for students with disabilities. Conversely, students who do not have these kinds of courses in their school schedule—those whose course taking emphasizes special education classes—miss more school, other things being equal. In addition, several kinds of accommodations and supports provided students with disabilities are related to their classroom behavior. Controlling for other factors, students who receive more modifications for tests, instructions, and assignments are more likely to receive lower engagement behavior scale scores in general education academic and vocational education courses. Although one could expect these kinds of supports to help students with disabilities feel more engaged and successful in their classes, it also is reasonable to expect that students who are struggling in class are the most likely to receive such supports. Although other factors related to disability and functioning are included in the analyses to attempt to control statistically for variations in students' needs for supports, a negative relationship between receiving supports and school engagement persists in general education academic and vocational education settings.

**Other school experiences.** Strong relationships exist between students' current school engagement and a variety of current and past experiences with school. The negative relationships between absenteeism and classroom engagement confirm the findings presented earlier that these aspects of school engagement are interrelated. Further, experiencing current or past behavior and/or academic problems at school is related to lower school engagement. Those who have been retained at grade level at some time in their school careers receive lower general education academic and special education classroom engagement scores, other differences held constant. Students who have been subject to disciplinary action or an in-school suspension are estimated to miss 7 more days of school per year other than for suspensions or expulsions and to have lower behavior scale ratings in all types of classes than those who have not had such problems. Changing schools frequently for reasons other than grade-level progression also is associated with greater absenteeism; students who have changed schools three times miss an estimated 4 days more of school per year than those who have made no changes, other things being equal.

Conversely, some school experiences are related to lower rates of absenteeism, including belonging to school groups. In this respect, youth with disabilities are similar to their peers in the general population, where participation in extracurricular activities is associated with increased school engagement (Brown & Evans, 2002; Jordan, 1999). Group participation usually is elective; students choose to participate in school groups because they enjoy the activities that are the focus of the groups (e.g., drama, sports). Having this type of self-selected affiliation is related to students with disabilities missing an estimated 3 fewer days of school per year.



### Exhibit 3-8 DIFFERENCES IN SCHOOL ENGAGEMENT ASSOCIATED WITH SCHOOL PROGRAMS AND EXPERIENCES OF YOUTH WITH DISABILITIES<sup>a</sup>

	Estimated Difference In:				
	Average Number of Days Absent per Year	General Education Academic Classroom Engagement Scale Score	Vocational Education Classroom Engagement Scale Score	Special Education Classroom Engagement Scale Score	For Increment
<b>School programs</b>					
Percentage of classes in general education academic classes	<b>-3.1**</b>				75% vs. 25%
Enrollment in a vocational education class	<b>-2.7*</b>				Yes vs. no
Class size	-.0	-.1	<b>-.1*</b>	-.1	22 students vs. 10
Number of social adjustment supports provided	1.0	-.2	-.0	-.1	Two vs. none
Number of modifications to tests, instruction, assignments, and grades provided		<b>-.6**</b>	<b>-.4*</b>	.0	Seven vs. one
Number of presentation/ communication aids provided		-.0	.4	.0	Five vs. none
<b>Other school experiences</b>					
Days absent per month		<b>-.4**</b>	<b>-.6***</b>	<b>-.6***</b>	5 vs. 0
Retention at grade level	-1.1	<b>-.3*</b>	-.1	<b>-.3*</b>	Yes vs. no
Subject to disciplinary action or in- school suspension this school year	<b>6.6***</b>	<b>-1.3***</b>	<b>-1.0***</b>	<b>-1.2***</b>	Yes vs. no
School mobility other than for grade-level changes	<b>3.6**</b>	-.2	.0	-.1	Three school changes vs. none
Membership in school groups	<b>-2.9**</b>				Yes vs. no

<sup>a</sup>Statistics in this exhibit are calculated from models that included the school programs and experiences shown in this exhibit, as well as individual characteristics (results shown in Exhibit 3-6) and household characteristics (results shown in Exhibit 3-7).

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

Exhibit reads: In a school year, youth who had 75% of their classes in a general education setting were absent 3.1 days less than youth who had 25% of their classes in a general education setting, all other variables being equal.

### Non-School-Related Outcomes

In addition to the school-related experiences discussed above, some experiences outside of school also could be expected to relate to the school engagement of youth with disabilities. For example, active involvement with friends or with jobs outside of school might compete with school responsibilities and result in higher absenteeism. In fact, seeing friends frequently is related to higher absenteeism; students who see friends outside of school 6 or 7 days per week are estimated to miss 3 more days of school per year than their peers who visit with friends an average of 1 day a week. However, holding a paid job is not associated with higher absenteeism for youth with disabilities.

### How Much Is Explained?

The four multivariate analyses of measures of school engagement each explain a statistically significant portion of the variation in the measures analyzed (p<.001), although a larger percentage of variation is explained in classroom behaviors than in absenteeism. Analyses of

classroom behavior produce  $r^2$  values of .18 for behavior in special education classes and .24 for behavior in general education academic and vocational education classes. In contrast, the  $r^2$  is .07 for absenteeism. More than half of the explained variation in engagement is attributable to disability and functioning. Overall, consideration of school program and experience factors adds more to the explanatory power of the analyses than household characteristics and parents' support for education.

### **Looking Back to NLTS**

The original NLTS examined the issue of classroom engagement, as indicated by the absenteeism of students with disabilities in their most recent school year (Wagner, 1991a), using the same regression analysis approach reported here for NLTS2. Despite more than a decade between studies and the richer database for NLTS2, which permits the inclusion of more school factors in the analysis, several findings are consistent across the two studies.

Students with visual impairments have consistently lower absenteeism than those with learning disabilities in both studies; however, the lower absenteeism of youth with hearing impairments and multiple disabilities in NLTS has not been maintained over time. Higher self-care skills also consistently relate to lower absenteeism for youth with disabilities. Differences in demographic factors are noted; although higher household income is consistently related over time to lower absenteeism, gender and racial/ethnic differences that are apparent in NLTS2 were not found in the earlier study. Although few school factors were included in the NLTS multivariate analysis of absenteeism, it did consider the extent to which students spent time in general education academic classes and whether their course schedule included a vocational education class. In both studies, taking vocational education is significantly related to lower absenteeism. General education academic class participation was not related to absenteeism in NLTS, although in NLTS2, students who take a greater portion of their courses in general education classes miss less school.

### **Summary**

This chapter examines the school engagement of students with disabilities, addressing the extent to which students enjoy school, are absent from school, and exhibit various behaviors that suggest engagement in classroom activities.

According to parents, most students with disabilities enjoy school. Nonetheless, they are somewhat less likely to enjoy school than their counterparts in the general population. On average, students with disabilities are absent about as frequently as those in the general population, but they are less likely to have perfect attendance. Approximately 60% usually stay focused on their classwork, and a similar percentage usually complete their homework on time. On the other hand, approximately 1 in 10 rarely stay focused in class, and 1 in 6 rarely complete their homework on time. Rates of class participation are lower, with half of students participating in classroom discussions frequently and one in six participating rarely. Although more than half of youth with disabilities rarely withdraw from social contact in their classes, one in eight usually or almost always withdraw from contact.

Students' levels of engagement are related to class setting (i.e., general, special, or vocational education classroom). Specifically, students with disabilities who take general education academic classes tend to be less engaged there than students with disabilities who take classes in

other settings. Furthermore, students with disabilities who take classes in all three settings are the least engaged when they are in general education academic classes. These patterns tend to hold across disability categories. The varying levels of engagement of students in different class settings suggest that the learning environment may play an important role in helping students with disabilities maintain interest in school.

Engagement at school varies by disability category, although multivariate analyses show less consistent differences than do bivariate analyses. For example, although bivariate analyses show that students with emotional disturbances are less engaged in school than are students with other disabilities on all measures, when other differences between students are controlled, those with emotional disturbances differ from students with learning disabilities only with regard to lower classroom engagement in vocational and special education classes. Similarly, in bivariate analyses, the most highly engaged students with disabilities are those with hearing or visual impairments. However, in multivariate analyses, those with hearing impairments do not differ on any measure from students with learning disabilities, and students with visual impairments differ only with regard to lower absenteeism.

Not surprisingly, several indicators of health and functioning are associated with measures of school engagement—better health with lower absenteeism, and higher functional cognitive skills, social skills, and persistence with better classroom engagement in most settings. Interestingly, higher levels of self-care skills are associated with lower engagement in general education classes but with higher in engagement in vocational education classes.

Relatively few demographic and family characteristics are associated with absenteeism or classroom engagement. One exception is that boys tend to be absent fewer days than girls; however, they also tend to have lower levels of engagement, regardless of setting. In addition, students whose families expect them to attend postsecondary school are more likely to be engaged in all three settings.

School factors make a difference in student engagement. Taking more courses in general education classes, enrollment in a vocational education class, and membership in school groups are associated with better attendance, whereas disciplinary actions and changing schools often are associated with higher absenteeism. That disciplinary actions and belonging to groups have opposite associations with engagement is not surprising, given that they are negatively related to each other (see Chapter 5).



#### **4. THE ACADEMIC PERFORMANCE OF SECONDARY SCHOOL STUDENTS WITH DISABILITIES**

**By Jose Blackorby, Michael Chorost, Nicolle Garza, and Anne-Marie Guzman**

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

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

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

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

## Indicators of Students' Academic Performance

### Teachers' Perceptions of Students' Academic Performance

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

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

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

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

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

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

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

	Percentage	Standard Error
Students whose grades are mostly:		
As and Bs	30.2	.2
Ds and Fs	8.4	.2
Students are expected to keep up in general education academic classes	97.4	1.0
Students who do keep up in general education academic classes	74.4	2.4
Source: NLTS2 Wave 1 parent interviews and students' school program survey.		

**Reading and Mathematics Performance**

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

the expected performance for a particular grade level, test results provide a framework for understanding the match or mismatch between expected performance and students' actual proficiency.

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

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

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

Source: NLTS2 Wave 1 students' school program survey.  
Standard errors are in parentheses.

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

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

### Relationships among Dimensions of Academic Performance

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

<b>Exhibit 4-3</b> <b>CORRELATIONS AMONG INDICATORS OF</b> <b>ACADEMIC PERFORMANCE OF YOUTH WITH</b> <b>DISABILITIES</b>			
	Grades	Tested Reading Performance Compared with Grade Level	Tested Mathematics Performance Compared with Grade Level
Keeps up with the class	.34 ( $<.0001$ )	.09 ( $<.0001$ )	.13 ( $<.0001$ )
Grades		.00 (.9094)	-.01 (.4981)
Tested reading performance compared with grade level			.75 ( $<.0001$ )
Significance levels are in parentheses.			

### Disability Differences in Students' Academic Performance

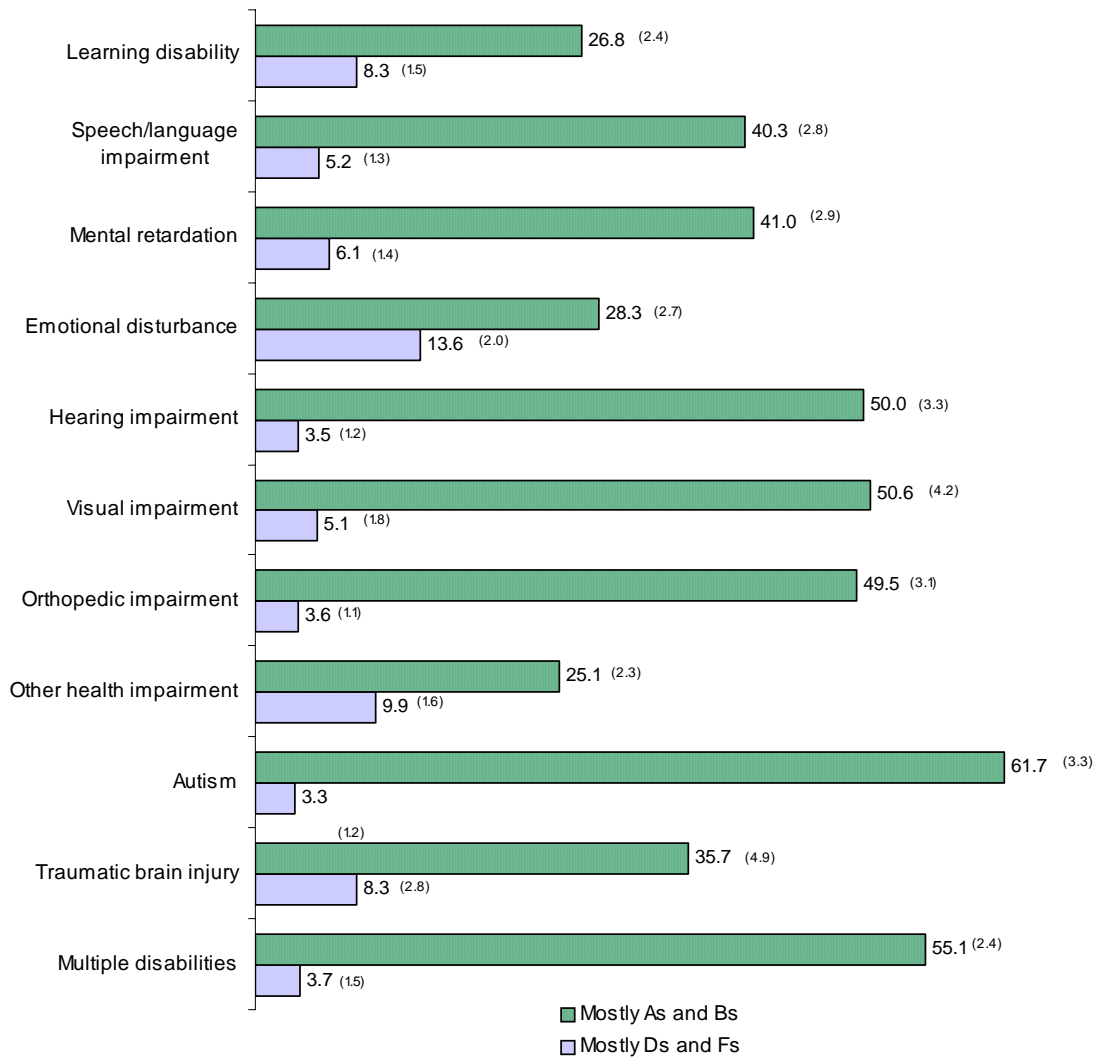
#### Teachers' Perceptions of Students' Academic Performance

High grades are common for youth in many disability categories. About half or more of students with hearing, visual, or orthopedic impairments, autism, or multiple disabilities receive "mostly As and Bs" (Exhibit 4-4). However, at least 25% of students

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



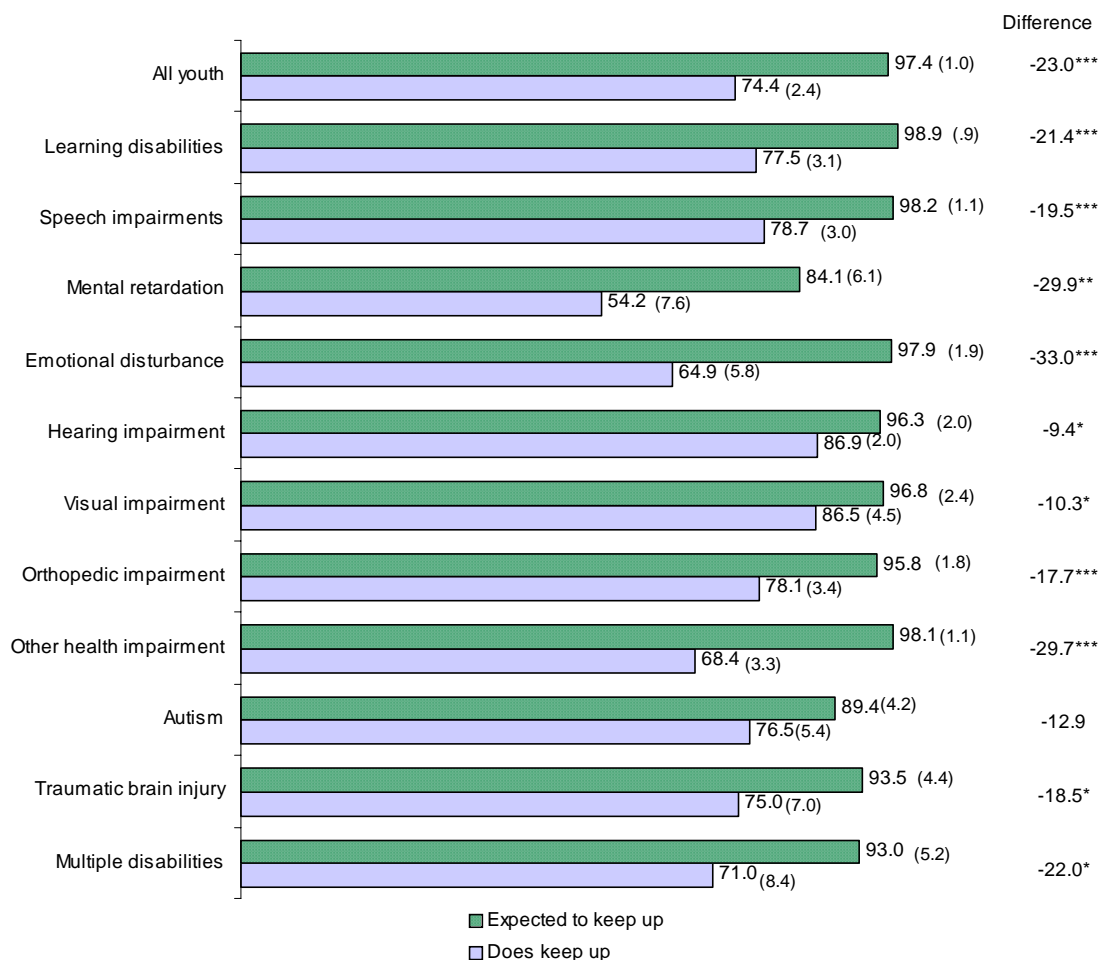
**Exhibit 4-4**  
**STUDENTS' GRADES, BY DISABILITY CATEGORY**



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

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

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



\*=p<.05, \*\*=p<.01, \*\*\*=p<.001

Note: There are too few youth with deaf-blindness in general education academic classes to report separately.  
 Standard errors are in parentheses.

### Reading and Mathematics Performance

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

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

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

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

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

Standard errors are in parentheses.

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

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

## **Factors Associated with Academic Performance**

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

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

### **Individual Characteristics**

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

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

### Exhibit 4-7

## DIFFERENCES IN ACADEMIC PERFORMANCE ASSOCIATED WITH INDIVIDUAL CHARACTERISTICS OF YOUTH WITH DISABILITIES<sup>a</sup>

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

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

<sup>b</sup> Grades are measured on a 9-point scale, ranging from "mostly As" and "mostly As and Bs" to "mostly Ds and Fs" and "mostly Fs."

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

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

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

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

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

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

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

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

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

### **Household Characteristics**

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

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

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

#### **Exhibit 4-8** **DIFFERENCES IN ACADEMIC PERFORMANCE ASSOCIATED WITH HOUSEHOLD CHARACTERISTICS OF YOUTH WITH DISABILITIES<sup>a</sup>**

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

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

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

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

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

### **School Programs and Experiences**

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

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

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

**Exhibit 4-9**  
**DIFFERENCES IN ACADEMIC PERFORMANCE ASSOCIATED WITH SCHOOL PROGRAMS AND EXPERIENCES OF YOUTH WITH DISABILITIES<sup>a</sup>**

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

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

<sup>b</sup> Grades were measured on a 9-point scale, ranging from “mostly As”, and “mostly As and Bs” to “mostly Ds and Fs” and “mostly Fs.”

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

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

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



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

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

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

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

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

## How Much Is Explained?

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

## Looking Back to NLTS

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

## Summary

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

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

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

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

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

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



## **5. THE SOCIAL ADJUSTMENT OF YOUTH WITH DISABILITIES**

**By Camille Marder, Mary Wagner, and Carl Sumi**

Adolescence is a time of dramatic physical, cognitive, emotional, and social change. In the fluid environment created by such changes, youth attempt to establish a sense of their own identity, independent of others (Erikson, 1968). Throughout this process, youth often experiment with alternative identities, roles, and behaviors as they probe the limits of acceptable behavior. That experimentation takes place at the same time that peer relationships become more complex and adult expectations regarding responsible behavior increase.

Although this is a turbulent time for most youth, the majority pass through the transition from middle childhood to young adulthood without serious incident. They establish healthy relationships, find socially acceptable ways to engage in activities that interest them, and make their way through school. However, a number of adolescents experience more challenges than their peers. An inability to “fit in” can trigger behavior problems that cause significant difficulty for both youth themselves and those around them, with repercussions such as suspensions or expulsions from school or arrests. At the extreme, poor social adjustment can result in self-injury or suicide, the third leading cause of death among adolescents (Centers for Disease Control and Prevention, 2002).

Many youth with disabilities encounter additional hurdles that complicate the already difficult time of adolescent transition. At a time when being like their peers is a high priority, many disabilities set youth apart in the ways they look, learn, or interact with others, presenting additional challenges to positive social adjustment. Some kinds of disabilities—particularly emotional disturbances, attention deficit or attention deficit/hyperactivity disorder (ADD/ADHD), and autism—are most directly associated with social adjustment difficulties. Because of the increased challenges of disabilities and their implications, youth with disabilities face a greater risk than their peers without disabilities for poor outcomes.

Special education services provided to youth with disabilities can address the behavioral issues that challenge their positive social adjustment. In fact, the Individuals with Disabilities Education Act Amendments of 1997 require the team that plans a student’s individualized education program (IEP) to consider, if appropriate, strategies to address behavior that impedes a student’s learning or that of others [Sec. 614(d)(3)(B)(i)]. Students receiving special education include a disproportionate number at high risk for delays or difficulties in social development, and it is these students who are most likely to be targeted for positive behavioral supports as part of the IEP or behavioral intervention plan.

To help strengthen such supports and target them effectively to youth who can benefit from them most, it is important to have a clear picture both of how youth with disabilities fare in regard to the complex construct of social adjustment and of the factors that are associated with more positive adjustment. This chapter examines the social adjustment of youth with disabilities in terms of their general social skills and their adjustment in the classroom and outside of school. First, multiple indicators of the social adjustment of all youth with disabilities are described and the relationships among them identified. Next, variations in social adjustment across the disability categories are presented. Finally, findings from multivariate analyses highlight the

associations between individual characteristics, family characteristics, school program and experiences, and services with social adjustment.

## **Dimensions of Social Adjustment of Youth with Disabilities**

### **General Social Skills**

Whereas some social behaviors are specific to a particular setting, such as the classroom, others are used in such a wide variety of situations that they signal general social competence. It is well established that such general competence is a key factor in school engagement and academic success (Cairns & Cairns, 1994; Coie, 1990; Dodge, 1990). With its broad array of items, the Social Skills Rating System (SSRS; Gresham & Elliot, 1990) is a widely accepted tool for measuring general social skills.

Using items from the SSRS, parents of youth with disabilities were asked to report how often their sons or daughters demonstrate each of the following nine aspects of social competence:

- Makes friends easily.
- Starts conversations rather than waiting for others to start.
- Seems confident in social situations, such as parties or group outings.
- Joins group activities, such as a group having lunch together, without being told to do so.
- Speaks in an appropriate tone at home.
- Avoids situations that are likely to result in trouble.
- Controls his or her temper when arguing with peers other than siblings.
- Ends disagreements with parent calmly.
- Receives criticism well.

Possible responses were “never,” “sometimes,” or “very often.”

Youth with disabilities show quite varied competence across the dimensions listed above (Exhibit 5-1). With the exception of receiving criticism well, between one-third and more than half of youth engage in each type of social skill measured “very often.” The skills at which they tend to be most adept are making friends, speaking in an appropriate tone at home, and avoiding situations that are likely to result in trouble. Approximately half of youth are reported to do each of these “very often.” Approximately 40% of youth are reported to start conversations rather than waiting for others to start them, to control their tempers when arguing with peers, or to feel confident in social situations “very often.” About one-third are reported “very often” to join group activities without being told to do so or to end disagreements calmly.

Although the percentages of youth who frequently engage in these activities may be heartening, it also is important to consider how many youth never do so. Here, youth also show considerable range across the various dimensions. For example, according to parents’ reports, approximately one-tenth of youth never start conversations, never avoid situations that are likely to result in trouble, or never control their temper when arguing with peers. In addition, 16% never end disagreements with their parents calmly or feel confident in social situations, and 22% never join group activities without being told to do so.

**Exhibit 5-1**  
**SOCIAL SKILLS OF YOUTH WITH DISABILITIES AND**  
**YOUTH IN THE GENERAL POPULATION**

Percentage of youth with frequency of activity	Youth with Disabilities <sup>a</sup>		Youth in the General Population <sup>b</sup>	
	Never	Very Often	Never	Very Often
Makes friends easily	8.6 (.9)	53.8 (1.6)	2.9 (1.3)	56.9 (3.8)
Starts conversations rather than waiting for others to start	11.4 (1.0)	42.3 (1.6)	12.6 (2.5)	32.8 (3.6)
Joins group activities, such as a group having lunch together, without being told to do so	22.0 (1.3)	34.8 (1.5)	12.1 (2.5)	44.3 (3.8)
Speaks in an appropriate tone at home	4.3 (.6)	52.0 (1.6)	.6 (.6)	50.6 (3.8)
Avoids situations that are likely to result in trouble	11.6 (1.0)	48.4 (1.6)	2.3 (1.1)	53.5 (3.8)
Controls his or her temper when arguing with peers other than siblings	12.5 (1.1)	38.8 (1.5)	9.2 (2.2)	35.1 (3.6)
Ends disagreements with parent calmly	16.1 (1.2)	34.1 (1.5)	7.5 (2.0)	38.5 (3.7)
Receives criticism well	27.3 (1.4)	16.7 (1.2)	14.4 (2.7)	20.7 (3.1)
Seems confident in social situations, such as parties or group outings	15.6 (1.1)	38.7 (1.5)	.0	62.1 (3.7)
Overall scale	Mean = 20.3		Mean = 21.3	

<sup>a</sup> Source: NLTS2 Wave 1 parent interviews.

<sup>b</sup> Source: American Guidance Service Social Skills Rating System national norms data, standardized in spring 1998.

Standard errors are in parentheses.

Of the various skills measured, receiving criticism appears to be particularly problematic; only 17% are reported to receive criticism well “very often,” and more than one-fourth (27%) are reported “never” to receive criticism well.

When parents’ ratings of youth with disabilities are compared with national norms on these items, it is clear that youth with disabilities are generally less skilled socially than their peers in the general population. With the exception of starting conversations and controlling their tempers, according to parents, youth with disabilities are significantly more likely than youth in the general population never to demonstrate each aspect of social competence. For example, whereas 3% of youth in the general population never make friends easily, 9% of youth with disabilities never do so ( $p < .001$ ). Similarly, all youth in the general population are reported to be confident in social situations at least sometimes, whereas 16% of youth with disabilities are reported never to be confident in social situations. On the other hand, youth with disabilities outperform youth in the general population in regard to one social skill; despite their lower level of social confidence, according to parents, youth with disabilities are more likely than youth in the general population very often to start conversations with others (42% vs. 33%,  $p < .05$ ).

An overall measure of general social skills was created by summing all nine items, yielding scores that range from 9 (parents indicated “never” to all items) to 27 (parents indicated “very often” to all items). Throughout the rest of this chapter, this scale is referred to as the “social

skills scale.” The mean score for youth with disabilities on the scale is 20.3; for students in the general population, the mean is significantly higher at 21.3.

### **Social Adjustment at School**

The behavior of youth at school is a crucial element in their overall social adjustment. Not only is school the context in which many youth spend most of their day, it also is where they engage in the important activities of gaining academic knowledge; learning and practicing more generalized skills, such as problem solving, being on time, and following directions; and developing formative relationships with peers and adults. Further, the consequences of their behavior at school can be powerful. As noted earlier, students’ inappropriate behavior at school can distract both the students themselves and those around them from their learning tasks. In addition, research has shown that teachers’ evaluation of students’ academic performance is influenced by the students’ behavior in the classroom (Polloway et al., 1994).

NLTS2 is investigating five aspects of the social adjustment of youth with disabilities at school: their behaviors in the classroom, their ability to get along with teachers and other students, their involvement with bullying at school, the extent to which they have been the subject of disciplinary actions for unacceptable behavior at school, and their progress toward transition goals related to their social adjustment.

**Classroom social behaviors.** To elicit information about youth’s social behavior in the classroom, NLTS2 asked teachers or school staff<sup>1</sup> the extent to which youth do the following:

- Get along well with other students in the classroom.
- Follow directions.
- Control their behavior to act appropriately in class.

According to teachers and other school staff, about one-third of students with disabilities get along “very well” with other students (Exhibit 5-2), and another half get along “well.” A similar percentage control their behavior “very well,” and slightly fewer control their behavior “well.” However, almost one in five students with disabilities control their behavior “not very well” or “not at all well.” Somewhat more youth appear to have difficulty following directions; school staff report that one-fourth do so “very well,” and a similar percentage follow directions “not very well” or “not at all well.”

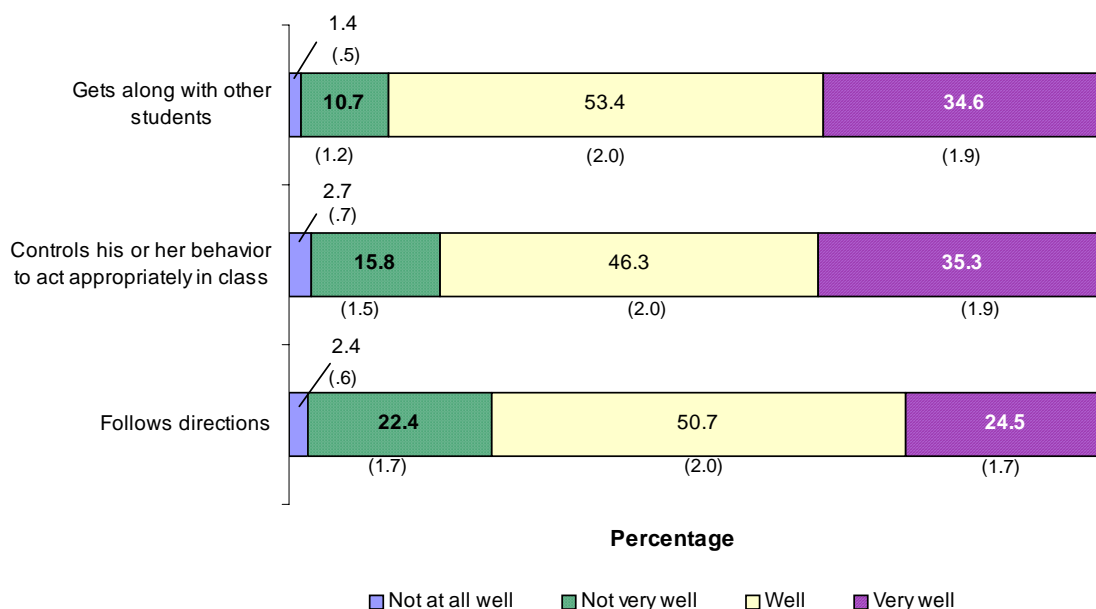
As an overall measure of classroom behaviors, a scale was created by summing the answers to the three questions. Throughout the rest of this chapter, this scale is referred to as the “classroom social behavior scale.” The scale ranges from 3 (does all of the behaviors “not at all well”) to 12 (does all of the behaviors “very well”). The mean score for youth with disabilities on this scale is 9.2.

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<sup>1</sup> See Chapter 1 for how decisions were made about the best respondent to these questions.



## Exhibit 5-2 CLASSROOM SOCIAL BEHAVIORS OF YOUTH WITH DISABILITIES



Source: NLTS2 Wave 1 teacher and school program surveys.  
Standard errors are in parentheses.

**Parents’ perspectives on students’ social adjustment at school.** To provide another perspective on students’ social adjustment at school, parents were asked how well their son or daughter gets along with other students and with teachers. Their reports indicate that youth get along about equally well with teachers and students. Almost half (47%) reportedly get along very well with teachers, and 46% get along very well with other students. Another 36% and 38% are reported to get along “pretty well” with teachers and students, respectively. The 84% of youth reported by parents to get along very well or pretty well with other students closely parallels the 88% of youth reported by teachers to get along very well or well with other students.

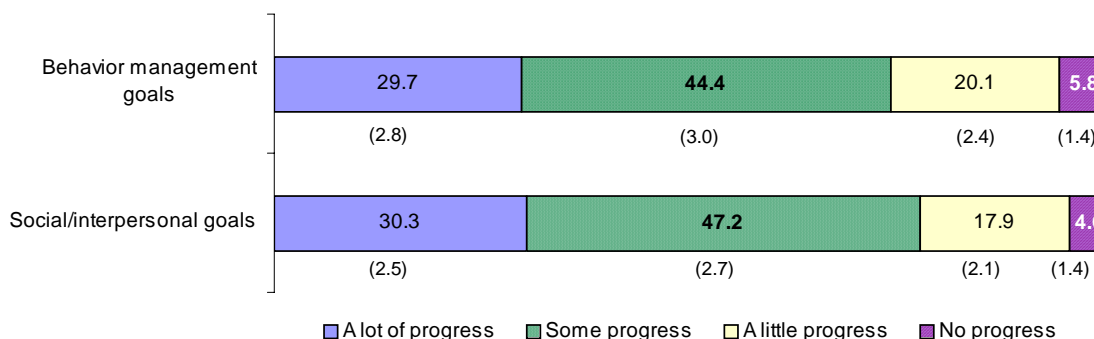
**Problem behaviors at school.** Although most youth with disabilities are reported to be getting along well at school, some exhibit problem behaviors. One such behavior involves bullying other students. Parents of youth with disabilities were asked whether their son or daughter had bullied or picked on other youth at school during the current school year; 16% reportedly had done so. In addition, school staff were asked whether youth had been suspended, expelled, or involved in any other type of disciplinary action, such as a referral to the office or detention, during the current school year. More than one-third of youth with disabilities (35%) have been involved in some type of disciplinary action in a school year.

**Progress toward transition goals related to social adjustment.** Youth’s social adjustment is not static. A variety of programs and services inside and outside of school can help youth with disabilities improve in this domain, and goals can be set as part of students’ transition plans. To measure students’ improvement, NLTS2 asked school staff to indicate the extent to

which students were making progress toward their social/interpersonal goals and their behavior management goals.<sup>2</sup>

School staff report that approximately three-fourths of youth with social adjustment transition goals are making at least “some progress” toward them (Exhibit 5-3). Indeed, 30% are reported to be making “a lot of progress.” Few youth are reported not to be making any progress at all.

**Exhibit 5-3**  
**PROGRESS BY YOUTH WITH DISABILITIES TOWARD**  
**TRANSITION GOALS RELATED TO SOCIAL ADJUSTMENT**



Source: NLTS2 Wave 1 teacher and school program surveys.  
Standard errors are in parentheses.

### Social Adjustment outside of School

Although the classroom is an important setting for youth, social activities outside of school also are crucial to their development. For many years, theory and research (e.g., Bronfenbrenner, 1979) have supported the important role of social interactions with peers, friends, parents, siblings, relatives, and others in the dynamic process of social adaptation and change. Friendships take on particular importance during adolescence, when teens detach themselves in some ways from their families (Raffaelli & Duckett, 1989) and use peers for some types of support that previously were provided by family members (Zetlin & Murtaugh, 1988). The degree of success in forming positive peer relationships can have important implications for youth’s broader social adjustment (Bukowski, Newcomb, & Hartup, 1996; Parker & Asher, 1987).

The lives of many youth are substantially enriched by their participation in organized extracurricular groups, which are defined broadly to include adult-sanctioned organized activities that youth do outside of the classroom, whether or not they are school sponsored. The social, psychological, and educational benefits of extracurricular activities are well known. Extracurricular participation has been shown to have a beneficial effect on academic performance (e.g., Marsh, 1992; Camp, 1990) and to diminish the likelihood of students’ dropping out of school (Mahoney & Cairns, 1997).

<sup>2</sup> These questions were asked only for students with these goals in their transition plans.

Although having friends and taking part in extracurricular activities may be crucial to healthy development, some kinds of disabilities can create challenges in these areas. For example, a hearing impairment can limit interactions with those who cannot use or understand manual communication. A visual impairment can limit the kinds of activities youth can engage in with friends. Autism and some kinds of behavioral disabilities can restrict or in other ways challenge social interaction with peers.

To understand the out-of-school social activities of youth with disabilities, parents were asked whether their sons or daughters belong to any type of organized group and how often they see friends outside of school and organized groups.<sup>3</sup>

Parents report that most youth with disabilities are fairly socially engaged. Approximately two-thirds (65%) belong to some type of school or community group (Exhibit 5-4). Almost one-third get together with friends outside of organized groups four or more times a week, and approximately another third see friends once to three times a week. Eighty-six percent of youth either belong to an organized group or see friends at least once a week outside of a group; however, 14% of youth do neither.<sup>4</sup>

<b>Exhibit 5-4 SOCIAL INTERACTIONS OF YOUTH WITH DISABILITIES</b>		
	Percentage	Standard Error
Belong to at least one school or community group	65.3	1.5
Get together with friends outside of organized groups:		
Frequently (four or more times a week)	30.5	1.5
Regularly (one to three times a week)	35.2	1.5
Occasionally (less than once a week)	24.8	1.4
Never	9.4	.9
Are socially engaged—get together with friends at least once a week or belong to at least one group	86.0	1.1
Source: NLTS2 Wave 1 parent interviews.		

Youth with disabilities are about equally likely as youth in the general population to belong to groups, but less likely to get together with friends outside of groups at least weekly. Parents report that about 61% of youth in the general population belong to some type of group (National Survey of America's Families, 1999), and approximately 93% of youth report that that they "hang out" with friends at least once a week ( $p < .05$  compared with youth with disabilities; Udry, 1998).

In contrast to these aspects of social integration, some youth with disabilities exhibit behaviors that so seriously violate community norms that they become involved with the criminal justice system. To assess such

behaviors, parents of youth with disabilities were asked whether their son or daughter had ever been arrested, stayed overnight in jail, or been on probation or parole. Parents report that 13% have been arrested; this group includes 4% of youth with disabilities who have spent a night in

<sup>3</sup> Friends may include youth both with and without disabilities.

<sup>4</sup> NLTS2 findings related to the friendship interactions of youth with disabilities are reported in more detail in Cadwallader & Wagner (2003). Findings related to their extracurricular activities are reported in more detail in Cadwallader, Wagner, & Garza (2003).

jail and 8% who have been on probation or parole. The arrest rate is not significantly different from the 15% of 14- to 17-year-olds in the general population who have been arrested.<sup>5</sup>

## **Relationships among Dimensions of Social Adjustment**

Although NLTS2 has investigated a variety of behaviors of youth with disabilities as they are exhibited in both school and nonschool settings, analyses demonstrate, not surprisingly, that they are interrelated measures of the broad concept of social adjustment (Exhibit 5-5). Correlations among the various indicators are modest, ranging from .01 to .39, although only one is not statistically significant with the relatively large NLTS2 sample—parents' reports of how well youth get along with teachers/students and how often youth get together with friends. In fact, the indicators of the social integration of youth outside the classroom—the frequency of their friendship interactions and whether they belong to school or community groups—are fairly weakly related both to each other (.10) and to other indicators. With the exception of their relationship to overall social skills, correlations of friendship interactions and group membership with other indicators of social adjustment are no larger than .16.

In contrast, indicators of negative social adjustment are more strongly related. Bullying, involvement with disciplinary actions, and arrests have correlations ranging from .21 to .28. Compared with youth who do not bully others, youth who do are twice as likely to be subject to disciplinary actions at school (60% vs. 29%,  $p < .001$ ) and/or to have been arrested (17% vs. 8%,  $p < .05$ ). In addition, more than three times as many youth who are subject to disciplinary actions have been arrested—19% compared with 5% ( $p < .001$ ).

Although seeing friends is normally considered a positive aspect of adolescent life, frequently seeing friends is related to being the subject of disciplinary action, bullying others, and arrests (correlations between .06 and .16,  $p < .0001$ ). Whereas approximately 28% of youth who see friends fewer than 3 days a week are involved in disciplinary actions, approximately 42% of youth who see friends more often than that have been subject to disciplinary actions ( $p < .05$ ). Similarly, whereas approximately 6% of youth who see friends fewer than 3 days a week have been arrested, 18% of youth who see friends more often have had such criminal justice system involvement ( $p < .01$ ).

As a measure of general social competence, it is not surprising that the social skills scale score has correlations as high as .39. General social skills are fairly highly correlated with interpersonal aspects of social adjustment, with correlations ranging from .20 for group membership to .39 for getting along with teachers and students. Correlations are lower with indicators of negative social adjustment that involve the school system: -.11 for disciplinary actions, and -.10 for arrests.

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<sup>5</sup> Calculated by using data from the 1999 National Longitudinal Survey of Youth (Bureau of Labor Statistics, U.S. Department of Labor).

**Exhibit 5-5**  
**CORRELATIONS AMONG INDICATORS OF**  
**THE SOCIAL ADJUSTMENT OF YOUTH WITH DISABILITIES**

	Classroom Social Behavior Scale	Gets Along with Teachers and Students	Belongs to a Group	How Often Sees Friends outside of Groups	Has Received Disciplinary Action in the Current School Year	Has Bullied Others at School	Has Been Arrested
Social skills scale score	.28 (p<.0001)	.39 (p<.0001)	.20 (p<.0001)	.27 (p<.0001)	-.11 (p<.0001)	-.22 (p<.0001)	-.10 (p<.0001)
Classroom social behavior scale score		.30 (p<.0001)	.10 (p<.0001)	.02 (.12)	-.32 (p<.0001)	-.23 (p<.0001)	-.13 (p<.0001)
Gets along with teachers and students			.10 (p<.0001)	.01 (.9042)	.31 (p<.0001)	-.37 (p<.0001)	-.24 (p<.0001)
Belongs to a group				.10 (p<.0001)	-.02 (.0483)	-.02 (.0497)	-.07 (.1167)
How often sees friends outside of groups					.16 (p<.0001)	.06 (p<.0001)	.16 (p<.0001)
Has received disciplinary action in the current school year						.28 (p<.0001)	.26 (p<.0001)
Has bullied others at school							.21 (p<.0001)

Source: NLTS2 Wave 1 parent interview, general education teacher survey, and student's school program survey.

Significance levels are in parentheses.

Another perspective on the interrelationships of general social competence with these aspects of social adjustment is provided by examining the profiles of youth with high and low social skills scale scores (Exhibit 5-6). Youth rated with high social skills have more positive social adjustment than lower-scoring youth on all indicators investigated in NLTS2. For example, 41% of youth with high social skills have high classroom social behavior scale scores, compared with 22% of those with medium social skills scores and 11% of those with low scores (p<.05 and p<.001). Among youth with high social skills, 79% belong to groups and 74% see friends at least weekly, compared with 52% and 54%, respectively, of low-scoring youth (p<.001 and p<.01). There also are striking differences between youth with different levels of social skills in terms of their likelihood of getting into trouble. Whereas 17% of youth with high social skills have been subject to a disciplinary action at school and 5% have been arrested, 40% of youth with low social skills have received a disciplinary action and 20% have been arrested (p<.001).

**Exhibit 5-6**  
**RELATIONSHIP OF SOCIAL SKILLS TO OTHER**  
**INDICATORS OF SOCIAL ADJUSTMENT AMONG**  
**YOUTH WITH DISABILITIES**

	Social Skills Rated as:		
	Low	Medium	High
Percentage with classroom social behaviors rated:			
Low	20.3 (3.3)	14.1 (1.9)	6.8 (3.6)
High	11.0 (2.5)	22.3 (2.3)	40.7 (7.1)
How well youth get along with others			
Not well	17.1 (2.2)	1.9 (.6)	.1 (.4)
Well or very well	52.5 (2.9)	83.5 (1.5)	94.9 (2.4)
Percentage who:			
Belong to a group	52.1 (2.8)	69.3 (1.9)	79.1 (4.4)
See friends outside of groups at least weekly	54.1 (4.1)	69.6 (2.6)	74.0 (6.4)
Bully others	31.5 (2.7)	12.8 (1.4)	2.8 (1.8)
Have been the subject of a disciplinary action at school in the last year	39.9 (2.8)	28.6 (1.9)	16.7 (4.0)
Have been involved with the criminal justice system	20.1 (2.3)	11.4 (1.3)	4.6 (2.3)

Source: NLTS2 Wave 1 parent survey.

Standard errors are in parentheses.

## Disability Differences in Social Adjustment

Clearly, differences in disabilities are associated with differences in social adjustment. Youth with learning disabilities or speech, hearing, visual impairments, or orthopedic impairments tend to excel, relative to other groups, on several measures of positive social adjustment (Exhibit 5-7). Between 77% and 82% score high or medium on the social skills scale, between 34% and 48% have high classroom social behavior scale scores, and at least 65% of youth in these categories belong to at least one social or community group. Youth with learning disabilities or speech impairments are among the most likely youth to see friends often; at least 68% do so.

However, these groups of youth do not form a single cluster with regard to negative social adjustment indicators. Whereas youth with visual or orthopedic impairments

are among the least likely to be involved with bullying, disciplinary actions at school, or to be arrested, youth with learning disabilities or speech or hearing impairments are more like other categories of youth on these measures. Nevertheless, all of these groups of youth are among the most likely to be reported as making progress toward their social/interpersonal goals, and youth with visual impairments are particularly likely to be making “a lot of progress” toward their behavior management goals.

At the other end of the spectrum are youth with emotional disturbances, autism, or multiple disabilities, who have the lowest levels of social skills and the poorest behavior in the classroom. Approximately 40% of youth with emotional disturbances or multiple disabilities, and almost 60% of youth with autism score low on the social skills scale. Thirty-six percent of youth with emotional disturbances and approximately 27% of youth with autism or multiple disabilities score low on the classroom social behavior scale.

On other dimensions of social adjustment, however, youth with autism or multiple disabilities differ from youth with emotional disturbances. Youth with autism are less social, being among the least likely of all youth to see friends or belong to groups, but they also are not particularly likely to get into trouble in school or with the criminal justice system. They also are

### Exhibit 5-7

#### SOCIAL ADJUSTMENT OF YOUTH, BY DISABILITY CATEGORY

	Learning Disabilities	Speech/ Language Impairment	Mental Retardation	Emotional Disturbance	Hearing Impairment	Visual Impairment	Orthopedic Impairment	Other Health Impairment	Autism	Traumatic Brain Injury	Multiple Disabilities	Deaf-Blindness
Percentage whose social skills scale score is: <sup>a</sup>												
High	10.2 (1.5)	12.6 (1.6)	4.1 (1.0)	2.8 (.9)	16.6 (2.1)	14.3 (2.5)	14.0 (1.9)	8.5 (1.3)	3.1 (0.9)	7.2 (2.4)	7.2 (1.4)	7.5 (2.7)
Low	22.8 (2.1)	20.0 (2.0)	33.9 (2.4)	40.8 (2.5)	19.2 (2.3)	17.6 (2.7)	20.2 (2.2)	29.8 (2.2)	57.7 (2.7)	30.5 (4.2)	37.1 (2.7)	35.1 (4.9)
Percentage whose classroom social behavior scale score is: <sup>a</sup>												
High	34.5 (3.1)	40.9 (3.5)	22.5 (2.8)	7.4 (2.2)	46.3 (3.9)	47.5 (4.6)	38.0 (3.6)	19.0 (2.4)	16.0 (2.7)	22.1 (5.1)	17.2 (2.9)	26.0 (5.9)
Low	9.7 (1.9)	9.4 (2.1)	20.8 (2.7)	36.0 (4.1)	8.8 (2.2)	9.4 (2.7)	11.2 (2.3)	22.4 (2.6)	27.9 (3.3)	20.9 (5.0)	27.3 (3.4)	14.2 (4.7)
Percentage who:												
Belong to a group	69.3 (3.1)	71.6 (3.1)	59.7 (3.4)	63.4 (4.1)	77.5 (3.4)	67.2 (4.6)	64.7 (3.4)	72.2 (2.9)	59.1 (3.4)	64.8 (5.9)	60.3 (3.8)	62.0 (6.2)
Get together with friends outside of groups weekly	69.7 (2.3)	68.4 (2.3)	53.9 (2.6)	66.0 (2.5)	59.5 (2.9)	52.8 (3.5)	46.4 (2.8)	66.5 (2.3)	24.3 (2.3)	62.6 (4.4)	37.8 (2.7)	37.9 (5.2)
Belong to a group or get together with friends at least once a week	87.5 (1.6)	89.3 (1.5)	79.6 (2.0)	85.9 (1.8)	87.3 (1.9)	81.7 (2.7)	79.4 (2.2)	90.3 (1.4)	63.8 (2.6)	84.7 (3.3)	74.1 (2.4)	73.0 (4.6)
Have bullied others	13.5 (1.7)	8.9 (1.4)	17.6 (2.0)	36.3 (2.6)	11.0 (1.8)	5.4 (1.6)	8.9 (1.6)	19.7 (1.9)	14.2 (1.9)	15.1 (3.3)	13.7 (1.9)	13.8 (3.7)
Have been subject to disciplinary action at school	32.1 (2.9)	22.4 (2.7)	33.7 (3.1)	64.3 (3.9)	25.0 (3.3)	15.5 (3.4)	15.9 (2.5)	39.1 (3.0)	15.0 (2.4)	32.0 (5.5)	20.4 (3.0)	25.8 (5.5)
Have been arrested	11.5 (1.6)	4.6 (1.1)	7.1 (1.3)	34.8 (2.5)	4.8 (1.2)	2.0 (1.0)	3.6 (1.0)	13.9 (1.7)	2.1 (0.8)	10.5 (2.8)	5.2 (1.2)	3.1 (1.8)
Percentage with progress toward interpersonal/ social goals <sup>b</sup>												
A lot of progress	34.7 (4.3)	34.8 (5.3)	22.9 (3.2)	25.3 (4.1)	35.9 (5.4)	32.2 (6.2)	30.7 (4.4)	25.7 (3.7)	18.8 (3.1)	25.4 (7.1)	19.4 (3.7)	16.6 (6.0)
No progress	3.0 (1.6)	4.2 (2.2)	4.8 (1.7)	9.6 (2.8)	.4 (.7)	3.8 (2.6)	3.2 (1.7)	6.8 (2.1)	2.8 (1.3)	3.8 (3.1)	6.6 (2.3)	.0 (.0)
Percentage with progress toward behavior management goals <sup>b</sup>												
A lot of progress	30.3 (4.8)	29.8 (6.1)	27.6 (4.0)	33.3 (4.5)	28.6 (6.1)	35.7 (7.1)	26.0 (6.0)	22.8 (3.9)	21.5 (3.5)	23.7 (7.7)	16.5 (4.1)	19.2 (7.5)
No progress	3.9 (2.0)	5.7 (3.1)	7.3 (2.3)	10.0 (2.8)	3.6 (2.5)	3.2 (2.6)	5.0 (3.0)	6.6 (2.3)	3.8 (1.6)	4.3 (3.7)	9.1 (3.2)	2.5 (3.0)

Sources: Social skills, belonging to groups, seeing friends, bullying others: NLTS2 Wave 1 parent interviews. Disciplinary actions, progress toward transition goals: NLTS2 Wave 2 school program survey.

<sup>a</sup> The category "medium" is omitted from the exhibit.

<sup>b</sup> The category "some progress" is omitted from the exhibit.

Standard errors are in parentheses.

among the least likely youth to be making a lot of progress toward their social/interpersonal goals or their behavior management goals. In contrast, youth with emotional disturbances are among the most likely of all youth to get together informally with friends at least once a week and to be making a lot of progress toward their behavior management goals. Where they stand out the most from other youth is that almost two-thirds of them have been subject to disciplinary actions at school, and approximately 35% have been arrested.

## **Factors Related to Social Adjustment**

Analyses presented thus far have demonstrated that the majority of youth with disabilities are relatively well adjusted socially—many are rated by parents as having high social skills, most behave reasonably well in class, and the majority see friends regularly and belong to organized groups in which they can build relationships and pursue their interests. Relatively few demonstrate negative social adjustment. However, there are dramatic differences in the social adjustment of youth with different primary disability classifications. Clearly, though, much more is involved in understanding variations in the social adjustment of youth with disabilities than is apparent from these disability category differences. What other factors are related to social adjustment, and how does the association of disability and social adjustment change when other factors are taken into account?

To answer these questions, multivariate analyses were used to examine the relationships between selected indicators of social adjustment and characteristics of youth themselves, their families, and their school programs and experiences. Multivariate analyses identify the independent relationship to social adjustment of each factor in the analysis, holding constant the effects of all other factors. Four indicators of social adjustment are used: two indicators of positive social adjustment—seeing friends at least weekly and belonging to groups—and two indicators of negative social adjustment—disciplinary actions at school and arrests.

### **Individual Characteristics**

**Disability characteristics.** These factors include the primary disability category of youth, whether they have ADD/ADHD as a primary or secondary disability, the age at which youth first were diagnosed with a disability or learning problem, and the number of functional domains in which youth experience some limitation. When other factors in the analysis are held constant, relationships between disability and social adjustment are weaker for the most part than in bivariate analyses (Exhibit 5-8). Nevertheless, there still are important relationships.

Consistent with the bivariate analyses presented earlier, multivariate analyses show that youth with emotional disturbances are the most likely to get into trouble. Holding constant other factors, they are 20 percentage points more likely than youth with learning disabilities to be subject to disciplinary actions at school and are 5 percentage points more likely to be arrested. Multivariate analyses also confirm the poor social integration of youth with autism and bring to the fore the relative lack of social integration of youth with orthopedic impairments. Compared with youth with learning disabilities, youth with autism are 8 percentage points less likely to belong to a group and 30 percentage points less likely to see friends at least weekly outside of school and group activities, and youth with orthopedic impairments are 10 percentage points less likely to belong to a group and 12 percentage points less likely to see friends informally at least weekly.



On the other hand, findings from multivariate analyses for youth in other categories differ somewhat from those reported earlier when disability category differences alone were examined. For example, multivariate analyses confirm the findings from bivariate analyses that youth with hearing impairments are more likely than youth with learning disabilities to belong to groups, but they also show that youth with hearing impairments are more likely to be subject to disciplinary actions at school. Similarly, multivariate and bivariate analyses both show that youth with visual impairments are about as likely as youth with learning disabilities to belong to groups and are less likely to be arrested; however, multivariate analyses show no difference between the two groups of youth in terms of seeing friends often or being subject to disciplinary action at school.

Three other disability characteristics also have significant relationships with social adjustment. Independent of their primary disability category, youth with ADD/ADHD are more likely than youth without it to be subject to disciplinary actions at school, as are youth who were older when their disabilities first were identified. However, youth who were older when their disabilities were identified are more likely than others to see friends at least weekly. In contrast, youth whose disabilities affect more functional domains are less likely to see friends regularly and are less likely to have been arrested.

**Functioning.** One might expect higher functioning to be associated with more positive social adjustment, and this expectation is borne out regarding the relationships of social skills to all four measures of social adjustment; those with higher skills have a higher likelihood of positive adjustment and a lower likelihood of negative adjustment. Youth with high scores on the social skills scale are 25 percentage points more likely than youth with low scores to see friends outside of groups at least weekly, 11 points more likely to belong to groups, 9 points less likely to have been subject to disciplinary action at school in a given year, and 2 points less likely to have been arrested. However, the relationships to social adjustment of other measures of functioning are less consistent in direction. For example, as expected, the higher the functional cognitive skills of youth, the more likely they are to see friends at least weekly, and the greater a youth's self-care skills, the higher his or her probability of belonging to groups. But higher self-care and cognitive functioning also are associated with a higher likelihood of being subject to disciplinary action at school, and higher functional cognitive skills also are related to a higher likelihood of having been arrested.

**Demographic characteristics.** Age is related to two aspects of social adjustment, but in opposite directions. Holding constant other factors, as youth get older, they are less likely to be subject to disciplinary actions at school but more likely to have been arrested. Boys and girls, once again, follow the pattern that youth who are most likely to see friends outside of groups at least weekly (boys) also are more likely to get into trouble in school and outside of school.

Regarding racial/ethnic background, African-American and Hispanic youth differ somewhat in their patterns of social adjustment. Hispanic youth are much less likely than white youth (16 percentage points) to belong to groups, but there is no difference in this regard between African-American youth and white youth. On the other hand, African-American youth are more likely, and Hispanic youth less likely, than white youth to be subject to disciplinary actions at school. Neither group differs significantly from white youth in their probability of seeing friends regularly or being arrested, other factors held constant.

**Exhibit 5-8**  
**DIFFERENCES IN SOCIAL ADJUSTMENT**  
**ASSOCIATED WITH INDIVIDUAL CHARACTERISTICS OF YOUTH WITH DISABILITIES<sup>a</sup>**

Estimated Difference in Probability of:					
	Belonging to a Group	Seeing Friends Outside of Groups at Least Weekly	Receiving Disciplinary Action at School	Having Been Arrested	For Increment
<b>Disability category</b>					
Speech/language impairment	2.9	-3.0	-1.4	-1.4	vs. learning disability <sup>b</sup>
Mental retardation	-.6	-3.4	2.6	-1.8	vs. learning disability
Emotional disturbance	-1.1	-7.8	<b>20.1***</b>	<b>4.7**</b>	vs. learning disability
Hearing impairment	<b>9.7**</b>	-5.4	<b>7.5*</b>	-1.0	vs. learning disability
Visual impairment	2.9	-4.4	-1.4	<b>-3.0*</b>	vs. learning disability
Orthopedic impairment	<b>-9.7*</b>	<b>-11.8**</b>	-4.4	<b>-2.6*</b>	vs. learning disability
Other health impairment	-2.6	-4.0	1.9	.5	vs. learning disability
Autism	<b>-8.1*</b>	<b>-29.3***</b>	<b>-11.6**</b>	<b>-3.4*</b>	vs. learning disability
Traumatic brain injury	2.6	.6	-2.3	.3	vs. learning disability
Multiple disabilities/deaf-blindness	-.7	<b>-9.6*</b>	2.2	.0	vs. learning disability
ADD/ADHD <sup>c</sup>	<b>5.2**</b>	2.7	<b>10.6**</b>	<b>1.1*</b>	Yes vs. no
Age at diagnosis	-1.1	<b>3.1**</b>	<b>4.3**</b>	.3	8 years old vs. 4 years old
Number of domains in which a youth has limitations	2.1	<b>-6.1***</b>	-1.2	<b>-9.9**</b>	Three domains vs. one
<b>Functioning</b>					
Self-care skills	<b>7.0*</b>	3.5	<b>13.4***</b>	1.4	High score (8) vs. low (4)
Functional cognitive skills	2.0	<b>12.5***</b>	<b>13.7***</b>	<b>2.4**</b>	High score (15) vs. low (7)
Social skills	<b>11.4***</b>	<b>25.0***</b>	<b>-9.0**</b>	<b>-2.5***</b>	High score (27) vs. low (17)
<b>Demographic characteristics</b>					
Age	-1.6	-2.1	<b>-8.7***</b>	<b>1.3**</b>	17 years old vs. 14 years old
Gender	-2.1	<b>8.3***</b>	<b>10.8***</b>	<b>2.2***</b>	Male vs. female
African American	.9	4.7	<b>5.4*</b>	.1	vs. white
Hispanic	<b>-15.5***</b>	-5.7	<b>-8.8**</b>	-.2	vs. white
Other or multiple race/ethnicity	-2.3	-.5	-6.9	.3	vs. white
Primarily language other than English spoken at home	-.7	-1.5	4.5	-.8	Yes vs. no

<sup>a</sup> Statistics in this exhibit are calculated from models that included all individual characteristics shown in this exhibit, as well as household characteristics (results shown in Exhibit 5-9), and school programs and experiences (results shown in Exhibit 5-10).

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

<sup>c</sup> ADD/ADHD is included to determine its relationships as a primary or secondary disability to academic performance, independent of youth's primary disability category.

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

Exhibit reads: The probability of belonging to a group is 10 percentage points higher for youth with hearing impairments than for youth with learning disabilities, other factors being equal. The probability of being subject to disciplinary action at school is 13 percentage points higher for youth with high self-care skills than for youth with low self-care skills.

## Household Characteristics

Family characteristics have strong associations with a youth's social adjustment (Exhibit 5-9). Income is related in opposite directions to the two measures of positive social adjustment. The higher a youth's household income, the more likely he or she is to belong to groups, but the less likely he or she is to see friends at least weekly outside of groups. The relationship of household income with measures of negative social adjustment is more consistent; youth from more affluent families are less likely to be involved with disciplinary actions at school and to have been arrested.

The importance of family involvement and support for their children is confirmed in these analyses. Family involvement at school is associated positively with both measures of social integration, with a particularly strong relationship to the likelihood of youth belonging to groups (many of which are at school). Youth whose families expect them to go to college are more likely to belong to groups and to see friends informally at least weekly, and are less likely to be subject to disciplinary actions at school.

**Exhibit 5-9**  
**DIFFERENCES IN SOCIAL ADJUSTMENT**  
**ASSOCIATED WITH HOUSEHOLD CHARACTERISTICS OF YOUTH WITH DISABILITIES<sup>a</sup>**

	Estimated Difference in Probability of:				For Increment
	Belonging to a Group	Seeing Friends outside of Groups at Least Weekly	Receiving Disciplinary Action at School	Having Been Arrested	
Household income	<b>6.7***</b>	<b>-6.1***</b>	<b>-4.5**</b>	<b>-1.2**</b>	\$55,000-\$60,000 vs. \$20,000-\$24,000
Family is involved at youth's school	<b>20.3***</b>	<b>4.3**</b>	-1.0	-0.2	High (6) vs. low (1)
Family expects youth to attend postsecondary school	<b>4.7*</b>	<b>4.4*</b>	<b>-4.1*</b>	-0.5	Definitely will vs. probably won't

<sup>a</sup> Statistics in this exhibit are calculated from models that included the family characteristics shown in this exhibit, as well as individual characteristics (results shown in Exhibit 5-8), and school programs and experiences (results shown in Exhibit 5-10)

\*p<.05, \*\*p<.01, \*\*\*p<.001.

Exhibit reads: The probability of belonging to a group is 7 percentage points higher for a youth whose household income is \$55,000 to \$60,000 than for a youth whose household income is \$20,000 to \$24,000. The probability of receiving a disciplinary action is 13 percentage points lower for youth whose families indicate that they definitely will attend postsecondary school than for youth whose families indicate that they probably won't.

## School Programs and Experiences

School programs and experiences also have strong associations with social adjustment. Here, the negative impacts of school mobility are apparent. The more times a youth has changed schools other than because of grade promotions, the less likely he or she is to belong to groups, and the more likely he or she is to be subject to disciplinary actions and to have been arrested (Exhibit 5-10). School performance also relates to social adjustment; compared with a youth who gets mostly C and D grades, a youth who gets mostly As and Bs is 12 percentage points less likely to be subject to disciplinary action at school. Not surprisingly, high grades also are

associated with a decreased probability of arrests. Relationships with positive social adjustment are mixed; whereas better grades increase a youth's likelihood of belonging to a group, they strongly decrease his or her likelihood of seeing friends at least weekly outside of groups.

Being included in general education classes also is related in desirable ways to the social adjustment of youth with disabilities. Independent of the nature of his or her disability, level of functioning, and demographic characteristics, the greater proportion of courses a student takes in general education classes, the more likely he or she is to belong to groups and the less likely he or she is to be subject to disciplinary actions. Compared with a youth who takes 25% of his or her courses in general education classes, a youth who takes 75% of courses there is 8 percentage points less likely to be subject to disciplinary action and 4 percentage points more likely to belong to groups.

### Exhibit 5-10 DIFFERENCES IN SOCIAL ADJUSTMENT ASSOCIATED WITH SCHOOL PROGRAMS AND EXPERIENCE OF YOUTH WITH DISABILITIES<sup>a</sup>

	Estimated Change in Probability of:				For Increment
	Belonging to a Group	Seeing Friends outside of Groups at Least Weekly	Receiving Disciplinary Action at School	Having Been Arrested	
School mobility	<b>-4.6*</b>	.7	<b>4.3*</b>	<b>1.8***</b>	Changed schools 3 times vs. not at all, except for promotions
Percentage of classes that are general academic education classes	<b>3.6**</b>	-2.7	<b>-7.5***</b>	-.5	75% vs. 25%
Overall grades	<b>8.2**</b>	<b>-18.7***</b>	<b>-11.7***</b>	<b>-1.3***</b>	Mostly As and Bs vs. mostly Cs and Ds
Receive mental health services <sup>b</sup>	2.0	3.2	6.0	<b>2.9***</b>	Yes vs. no
Receive social work services	-.0	<b>5.4*</b>	3.3	<b>2.0***</b>	Yes vs. no
Had a behavior management plan	-1.2	2.3	<b>27.7***</b>	1.1	Yes vs. no
Take part in an anger management program	3.3	1.7	<b>9.1***</b>	.7	Yes vs. no
Have services from a behavioral interventionist	1.5	3.9	<b>27.7***</b>	<b>2.7***</b>	Yes vs. no

<sup>a</sup> Statistics shown are calculated from models estimated with the school programs and experiences shown in this exhibit, as well as individual characteristics (results shown in Exhibit 5-8), and household characteristics (results shown in Exhibit 5-9). Numbers shown for school mobility, percentage general education academic classes, and overall grades are from models estimated without the variables for programs and services. When models were estimated with each program or service, coefficients did not change significantly.

<sup>b</sup> Each program or service was entered separately into a model containing school mobility, percentage general education academic classes, and overall grades, as well as all variables shown in Exhibits 5-8 and 5-9. Programs and services were not entered simultaneously because of moderate to high intercorrelations.

\*p<.05, \*\*p<.01, \*\*\*p<.001.

Exhibit reads: The probability of belonging to a group is 5 percentage points lower for youth who changed schools 3 times, except for promotions, than for youth who did not change schools at all, except for promotions. The probability of being subject to a disciplinary action at school is 12 percentage points lower for youth whose who get mostly As and Bs than for youth who get mostly Cs and Ds.

When youth have difficulties in social adjustment, schools and parents may seek to help through a variety of types of programs and/or services. Among those investigated in NLTS2 are mental health services; social work services; behavior management programs; services from a behavioral interventionist; and a conflict resolution, anger management, or violence prevention program. To investigate the extent to which each of these types of supports is associated with better social adjustment, each type was included separately in analyses that included all of the other factors discussed thus far.

These analyses suggest that most services in Exhibit 5-10 are not significantly associated with the two measures of positive social adjustment. The exception is that social work services are associated with a higher likelihood of youth's seeing friends at least weekly. However, all types of programs and services are associated with higher probabilities of the two negative measures of social adjustment, and in some cases, these associations are quite strong. For example, youth who have behavior management plans are almost 30 percentage points more likely to be subject to disciplinary actions at school; in fact, however, it well may be that having disciplinary problems at school results in youth's having such plans or participating in some of the programs investigated in NLTS2.

This likely confounding of receipt of services and social adjustment outcomes may relate to the fact that these analyses are based on cross-sectional data; that is, data are reported at one point in time. Therefore, it is highly likely that service receipt does not increase a youth's probability of getting in trouble at school or in the community, but that youth who get in trouble are much more likely than other youth to receive these types of services. Using longitudinal data, NLTS2 will be able to disentangle this phenomenon in future reports.

### **How Much Is Explained?**

The multivariate analyses are helpful in explaining associations of various factors with measures of social adjustment, holding all other factors constant, and they explain a significant portion of variation in each social adjustment measure. Because logistic regression analyses do not produce the typical measure of explained variation ( $r^2$ ), an alternative statistic was calculated that indicates the "predictive improvement," or PI, that can be obtained by adding an independent variable to a logistic regression. Across the full models, PI values range from .13 to .17.<sup>6</sup> Individual characteristics are by far the strongest predictors of the various measures of social adjustment, with the exception of belonging to groups, accounting for almost all of the predictive power of the model for whether a youth sees friends frequently and three-fourths of the predictive power of the model for whether a youth has had disciplinary actions at school. In contrast, individual characteristics account for only approximately 60% of the model's power to predict whether or not a youth belongs to groups. Family characteristics increase the PI value of this model from .08 to .15.

Variables for school programs and experiences add predictive power only to the probability of being subject to a disciplinary action at school, increasing the PI value from .14 to .17. They do not contribute to the model of seeing friends, and they somewhat decrease the predictive power of the models related to whether youth belong to groups or have been arrested. The

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<sup>6</sup> PI values range from 0 to 1 in a similar way to a conventional  $r^2$  statistic. See Appendix A for a description of the PI calculation.

decrease in predictive power most likely results from the loss of cases when the school variables are entered into the analyses. None of the service variables affect the predictive power of the models.

### **Looking Back to NLTS**

Three of the indicators of social adjustment that are included in multivariate analyses in NLTS2 were subject to similar analyses in the original NLTS, using data collected from parents in 1987 or from schools in the 1985-86 or 1986-87 school year. Although the NLTS2 database is much richer than that of NLTS, thereby enabling consideration of a wider array of factors that may relate to social adjustment, many of the findings of the two analyses are similar.

The active social involvement of youth with hearing and visual impairments and their general avoidance of trouble at school and in the community are apparent at both time points. Similarly, the challenges to social integration posed by physical impairments also are consistent over time. Unfortunately, so is the propensity of youth with emotional disturbances to be arrested.

Relationships of functioning to social adjustment also are stable over time. In both NLTS and NLTS2, functional cognitive skills are related to a higher likelihood of both positive and negative social adjustment. Apparently, higher cognitive functioning facilitates both positive social involvement and the energy and imagination to get into trouble.

Some demographic factors also are similarly related to social adjustment in both studies. Young men with disabilities are consistently more likely than young women to have been arrested, as are older youth compared with their younger peers. However, relationships of race/ethnicity to social adjustment are more complex today. Whereas in 1987, minority status was related to only one of the social adjustment measures studied—the probability of arrest—racial/ethnic differences no longer are associated with differences in arrest rates; however, they do relate to differences in positive social adjustment, although in different directions for African American and Hispanic youth.

Finally, the NLTS database did not permit analysis of relationships between the kinds of programs and services investigated in NLTS2 (e.g., anger management programs, behavior intervention plans). However, inclusion in general academic education classrooms was a factor in analyses of social adjustment in both times periods, and results are similar. Students with disabilities who take a larger portion of their courses in general education classes are more likely to be positively socially integrated, as measured by belonging to one or more groups at school or in the community.

### **Summary**

Findings in this chapter present a mixed picture of the social adjustment of youth with disabilities. There is considerable good news in that many youth with disabilities are reported to be socially quite well adjusted. Between one-third and one-half are reported by parents “always” to exhibit a variety of social skills, and most other youth are reported to do so at least some of the time. The majority of youth also behave well in the classroom, reportedly getting along well with their teachers and other students, controlling their behavior, and following directions. Most youth with disabilities also are socially integrated outside the classroom; approximately two-thirds belong to some type of organized group, and a similar percentage see friends at least once

a week outside of school and organized group activities. Teachers report that approximately three-fourths of youth who have social integration goals or behavior management goals in their transition plans are making good progress toward meeting them.

However, social adjustment challenges clearly remain for some youth with disabilities. According to parents, approximately one in six youth with disabilities never seem confident in social situations. In addition, approximately 1 in 10 are reported never to make friends easily, start conversations, control their temper when arguing with peers, or avoid situations that are likely to result in trouble. One in six reportedly never end disagreements with their parents calmly, and one in five never join group activities without being told to do so. Furthermore, approximately one in eight do not get along well with other students, and one in six do not control their behavior in the classroom. One in six are reported by parents to have bullied other students in school, and twice that number are reported to have been subject to some type of disciplinary action in school. According to school staff, one in four youth with disabilities who have transition goals related to improved social adjustment are not making much progress toward them. Outside of school, one in seven appear to be somewhat poorly integrated socially, in that they do not belong to any type of organized group and see friends less often than once a week. Approximately one in eight have been arrested.

Youth with learning disabilities or with speech, hearing, visual, or orthopedic impairments tend to have the highest levels of social adjustment. Youth with emotional disturbances, autism, or multiple disabilities tend to have the lowest social skills and poorest classroom behavior. In addition, youth with autism or multiple disabilities are among the least socially integrated outside the classroom, but they do not tend to get into trouble. In contrast, youth with emotional disturbances see friends regularly but are much more likely than any other group to have been arrested.

A youth's disability category is not the only factor related to his or her social adjustment. The youth's level of functioning, demographic characteristics, family characteristics, and school program and experiences also are related. In fact, when these factors are held constant in multivariate analyses, the associations between disability category and four measures of social adjustment tend to be somewhat weakened.

General social skills are associated with higher social adjustment, no matter what the measure; they increase a youth's likelihood of belonging to groups and seeing friends outside of groups, and they decrease his or her likelihood of getting into trouble in school and with the law. On the other hand, higher levels of self-care skills and functional cognitive skills also are associated with higher probabilities of both measures of positive social adjustment and poor social adjustment. The number of functional domains in which a youth has difficulties also follows this pattern: youth with problems in fewer domains are more likely to see friends regularly but also are more likely to have been arrested.

A youth's demographic and family characteristics have some association with his or her social adjustment, in that boys are more likely than girls to see friends regularly but also more likely to get into trouble. In addition, African-American youth are more likely and Hispanic youth less likely than white youth to have disciplinary problems at school. Also, youth from more affluent families tend to have better social adjustment, and youth whose families are involved at their schools and who have high expectations for their educational futures tend to be

socially more integrated. Family expectations that a youth will attend postsecondary school also are associated with a lower likelihood of disciplinary actions at school.

A youth's school program and experiences have strong associations with his or her social adjustment in predictable ways. Youth who change schools frequently tend to be socially less integrated and get into more trouble. At the same time, youth who take more courses in general education classes and those who get better grades tend to be socially more integrated and are less likely to get into trouble.

This chapter also investigated the associations of several types of social adjustment supports with youth's social adjustment. Findings show positive associations between receipt of supports and the two measures of poor social adjustment because students are likely to receive social supports because of poor behavior. Using longitudinal data, future NLTS2 research will overcome this limitation of measuring service receipt and related outcomes at the same point in time and disentangle these effects.



## **6. THE EMERGING INDEPENDENCE OF YOUTH WITH DISABILITIES**

**By Renée Cameto, Phyllis Levine, Mary Wagner, and Camille Marder**

For the better part of the last century, people with disabilities often were viewed as “victims” or “patients,” roles that placed them in the position to be “helped” or “treated,” which often left little room for independence or personal choice. This philosophical approach, referred to as “the medical model” (Wolfensberger, 1983), governed disability practice and policy for years. By the latter part of the 20th century, the deinstitutionalization movement, a surge in advocacy, heightened public awareness, and support from legislation had changed how society interacts with people with disabilities. For the most part, the medical model has given way to a “social model” of disability that focuses on the individual rather than the impairment, with emphasis on health promotion, access, independence, and community (Patrick, 1997).

The notion that individuals with disabilities could and should participate fully in the community gained strong support with the passage of the federal Americans with Disabilities Act in 1990. This act barred discrimination in employment, commercial facilities, public accommodations, transportation, and government services. In 2001, further federal support for the independence of people with disabilities came in the form of the “New Freedom Initiative,” a comprehensive set of proposals that seeks to promote full access to community life for individuals with disabilities including the domains of education, employment, transportation, technology, and home ownership.

In recent years, the perspective that individuals with disabilities should be as independent as possible has been reflected in a notable change in the way young people with disabilities are viewed and treated by the adults in their lives. Increasingly and justifiably, youth with disabilities are viewed as capable of determining their own futures. Students receiving special education services in secondary school are being encouraged to develop decision-making and self-determination skills as ways to enhance their ability to express their views and advocate for their preferences and needs, and to make personal judgments that reflect competence, motivation, and personal ambition (Johnson & Sharpe, 2000; Zhang, 2001).

Studies show that students who are expected to take responsibility for planning their futures and to engage in self-determination activities in secondary school also take greater responsibility for their lives after school (Malian & Nevin, 2002; Price, Wolensky, & Mulligan, 2002). This early experience with responsibility can be manifested in several ways. For example, students who work or have some type of vocational experiences during high school are exposed to decision-making opportunities and gain experience in personal responsibility (e.g., getting to work on time, performing expected tasks, making appropriate choices, setting priorities). As the self-determination movement grows, youth with disabilities are likely to gain increased functional, self-care, and financial management skills, and to become increasingly active in setting their own courses into young adulthood.

This chapter highlights indicators of emerging independence for youth with disabilities as they prepare for the transition from high school to early adulthood. This broad range of dimensions of the complex construct of independence includes skills that strengthen self-reliance, such as managing self-care needs and knowing how to advocate for oneself. Another view of independence comes from teachers’ assessments of how much progress youth are

making toward transition goals related to independence, including goals for independent living, self-advocacy, and employment. Independence indicators also involve behaviors that suggest emerging responsibility for daily activities, including financial management and household chores. Emerging independence in the community is indicated by earning driving privileges or having a regular paid job.

The domains of independence measured in NLTS2 were identified by technical advisors in the study design process as important and mirror several that were included in the original NLTS. They are:

- Managing self-care activities.
- Using functional cognitive skills.
- Being mobile.
- Persisting in completing tasks.
- Self-advocating.
- Participating in transition planning and making progress toward independence-related transition goals.
- Having financial management responsibilities.
- Taking on household responsibilities.
- Earning driving privileges.
- Having regular paid employment.

Independence is described on these dimensions both for youth with disabilities as a group and for those who differ in their primary disability category. Then the relationships among these multiple indicators of independence are explored. Finally, two indicators—taking on household responsibilities and regular paid employment—are analyzed in more detail. These two indicators have been selected for multivariate analysis because they foreshadow the kinds of activities independent adults generally assume.

## **Dimensions of Independence of Youth with Disabilities**

### **Skills That Support Independence**

NLTS2 has investigated the extent to which youth with disabilities are acquiring a variety of skills that enhance their ability to become increasingly independent as they age. These skills involve caring for their personal physical needs, cognitively processing and acting on information, moving around in the environment, persisting with tasks, and advocating for oneself.<sup>1</sup>

**Self-care skills.** To assess the independence of youth in caring for their fundamental physical needs, parents of youth with disabilities were asked to rate how well youth can feed and dress themselves without help on a 4-point scale from “not at all well” to “very well.” A

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<sup>1</sup> NLTS2 findings related to self-care and functional cognitive skills are reported in greater detail in Cameto et al. (2003).

summative scale of abilities ranges from 2 (both skills done “not at all well”) to 8 (both skills done “very well”).

According to parents, the vast majority of youth feed and dress themselves on their own “very well” (Exhibit 6-1); only 3% and 6% feed and dress themselves less well, respectively. Virtually all youth (94%) have a high self-care skills scale score.

<b>Exhibit 6-1 SELF-CARE SKILLS OF YOUTH WITH DISABILITIES</b>		
	Percentage	Standard Error
Feeds him/herself without help		
Very well	96.8	.5
Pretty well	1.9	.4
Not very or not at all well	1.2	.3
Dresses him/herself without help		
Very well	93.8	.8
Pretty well	3.8	.6
Not very or not at all well	2.3	.5
Self-care scale score		
High (8)	93.5	.8
Medium (5 to 7)	5.1	.7
Low (2 to 4)	1.3	.4

Source: NLTS2 Wave 1 parent interviews.

**Functional cognitive skills.** Parents were asked to use the same 4-point scale to evaluate their children regarding four skills that often are used in daily activities: reading and understanding common signs, telling time on a clock with hands (i.e., an analog clock), counting change, and looking up telephone numbers and using the telephone. These skills are referred to here as functional cognitive skills because they require the cognitive ability to read, count, and calculate. As such, they suggest much about students’ abilities to perform a variety of more complex cognitive tasks independently. However, they also require sensory and physical skills (e.g., seeing signs, manipulating a telephone). Consequently, a high score indicates high functioning in all of

these areas, but a low score can result from a deficit in one or more of the cognitive, sensory, or physical domains.

Parents report that youth with disabilities have more difficulty performing functional cognitive skills than the self-care skills described previously. Still, most youth have mastered these tasks (Exhibit 6-2). Approximately 92% of youth read and understand common signs “very well” or “pretty well,” whereas about 82% tell time or count change with these levels of skill. Looking up telephone numbers and using the telephone appears to be the most difficult task; about 75% of youth perform this task “very well” or “pretty well,” according to parents. A scale of general functional cognitive abilities was constructed by summing responses to the four items; it ranges from 4 (all skills done “not at all well”) to 16 (all skills done “very well”). Overall, about half of youth score high on this scale (a score of 15 or 16), and a small percentage (about 6%) score low (a score of 4 to 8) on the functional cognitive skills scale.

**Mobility.** Getting around outside the home involves both cognitive and physical abilities, and can be difficult for youth who have limitations in either or both of these areas of functioning. The ability of youth to navigate the nearby environment outside their homes was assessed by using parents’ ratings of how well youth are able to “get to places outside the home, like to school, to a nearby store or park, or to a neighbor’s house.” Parents responded on a 4-point scale ranging from “very well” to “not at all well” (Exhibit 6-3). The majority of youth get around in their local area “very well” (about 75%) or “pretty well” (about 18%).

Getting around independently can be especially problematic for youth with visual impairments. Information on their mobility skills was collected for all youth identified as having

**Exhibit 6-2**  
**FUNCTIONAL COGNITIVE SKILLS OF**  
**YOUTH WITH DISABILITIES**

	Percentage	Standard Error
Reads and understands common signs		
Very well	76.5	1.3
Pretty well	15.7	1.1
Not very or not at all well	7.8	.8
Tells time on an analog clock		
Very well	61.6	1.5
Pretty well	21.6	1.3
Not very or not at all well	16.8	1.2
Counts change		
Very well	58.5	1.6
Pretty well	24.1	1.3
Not very or not at all well	17.4	1.2
Looks up telephone numbers and uses the phone		
Very well	51.4	1.6
Pretty well	24.2	1.4
Not very or not at all well	24.4	1.4
Functional cognitive skills scale score		
High (15 or 16)	48.9	1.6
Medium (9 to 14)	45.6	1.6
Low (4 to 8)	5.5	.7

Source: NLTS2 Wave 1 parent interviews.

a visual impairment, either as reported by school districts as the primary disability classification or by parents as one of a youth's disabilities. School staff who were best qualified to describe the overall school programs of these students were asked to report how well ("not very well," "pretty well," "very well") the students are able to perform 10 mobility activities (e.g., travel indoors using rote learned routes, execute a route given a verbal set of directions).<sup>2</sup> A composite mobility performance score was calculated by summing these responses, which range from 10 to 30. More than one-third (37%) of students with visual impairments are reported by school staff to perform in the low range, and another 38% are reported to have high mobility skills.

**Self-determination.** The road to independence for adolescents includes the development of a variety of self-determination skills, including persisting with tasks to completion and knowing how and when to advocate for oneself. To assess persistence, parents were asked how

often youth "keep working at something until he/she is finished, even if it takes a long time." Responses included "very often," "sometimes," and "never." Self-advocacy is assessed by using ratings by school staff of how well a student can "ask for what s/he needs in order to do his or her best in class." They rated this self-advocacy skill on a 4-point scale that ranges from "very well" to "not at all well."

Parents of most youth with disabilities report that their sons or daughters are persistent with a task "very often" (35%) or "sometimes" (49%; Exhibit 6-4). Only 16% of youth "never" follow a task through to completion, according to parents. School staff report that most youth with disabilities are developing self-advocacy skills, with about one in five (21%) asking for what they need "very well" and about twice as many (41%) self-advocating "well."

### Transition Planning and Goals

Other potential indicators of emerging independence for youth with disabilities involve their plan for transitioning from secondary school to early adulthood. NLTS2 has investigated two aspects of independence related to transition plans: students' level of participation in their own transition planning and the progress they are making toward transition goals they set that relate to independence.

<sup>2</sup> Appendix A provides the full set of these items.

**Exhibit 6-3**  
**MOBILITY OF YOUTH WITH DISABILITIES**

	Percentage	Standard Error
How well all youth with disabilities get to places outside the home:		
Very well	74.3	1.4
Pretty well	17.5	1.2
Not very well	4.8	.7
Not at all well	3.3	.6
Mobility scale score (youth with visual impairments only)		
High (24-30)	38.5	5.8
Medium (16-23)	24.2	5.1
Low (10-16)	37.4	5.8

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

**Exhibit 6-4**  
**PERSISTENCE AND SELF-ADVOCACY SKILLS OF YOUTH WITH DISABILITIES**

	Percentage	Standard Error
Persistence—How often youth keeps working at something until finished		
Very often	35.0	1.5
Sometimes	48.6	1.6
Never	16.4	1.2
Self-advocacy—How well youth asks for what s/he needs to succeed in class		
Very well	20.9	1.7
Well	41.0	2.0
Not very well	29.0	1.9
Not at all well	9.1	1.2

Source: NLTS2 Wave 1 parent interviews, general education teacher survey, and student's school program survey.

**Participation in transition planning.** The Individuals with Disabilities Education Act Amendments of 1997 (IDEA '97) require that by age 14, the individualized education plan (IEP) of every student with disabilities include consideration of his or her transition to postschool life and a statement of the course of study the student should undertake to reach his or her transition goals (e.g., a college preparatory course of study if postsecondary education is a goal, vocational education if employment after high school is a goal). Teaching students the skills to participate in this transition planning process actively and providing opportunities to practice them facilitate stronger self-determination, both during and after leaving school, when youth negotiate their shifting role from student to adult (Stodden & Jones, 2002).

School staff who were most knowledgeable about students' overall school programs and the transition planning process were asked to indicate how involved students with disabilities are in the process. More than half of students with disabilities (58%) reportedly provide at least some input toward planning their transition goals and activities during their IEP or ITP process (Exhibit 6-5), and another 12% of students take on a leadership role on their own behalf. Whereas only 6% do not attend their own transition plan

development meeting, another quarter are present at the meeting but do not contribute much to the process.

**Progress toward independence-related transition goals.** Another benchmark against which to assess how independent youth with disabilities are becoming involves the goals each student has as part of his or her transition plan. School staff best able to describe the school programs and transition plans of students with disabilities were asked how much progress they believe each student is making toward a variety of transition goals. Three of these goals relate to future independence: "independent living goals (e.g., personal management, getting a driver's license)," "vocationally oriented goals," and "self-advocacy goals." Those who responded that a

student had such goals were asked to report whether the student is making “a lot of progress,” “some progress,” “a little progress,” or “no progress.”

<b>Exhibit 6-5</b> <b>YOUTH'S TRANSITION PLANNING</b> <b>PARTICIPATION AND PROGRESS TOWARD</b> <b>INDEPENDENCE-RELATED</b> <b>TRANSITION GOALS</b>		
	Percentage	Standard Error
Reported to take following role in transition planning:		
A leadership role	12.2	1.5
Provides input	57.7	2.3
Present but not participating	24.7	2.0
Not present	5.5	1.1
Reported as making the following progress toward independent living goals:		
A lot of progress	35.9	2.5
Some progress	40.7	2.5
A little progress	18.2	2.0
No progress	5.2	1.1
Reported as making the following progress toward vocationally oriented goals:		
A lot of progress	23.0	2.1
Some progress	46.3	2.5
A little progress	24.9	2.1
No progress	5.8	1.2
Reported as making the following progress toward self-advocacy goals:		
A lot of progress	26.0	2.3
Some progress	43.5	2.6
A little progress	24.0	2.2
No progress	6.6	1.3
Source: NLTS2 Wave 1 student's school program survey.		

For youth with these three types of transition goals, school staff report somewhat greater progress by youth toward the independent living goals than toward either the vocationally oriented or self-advocacy goals (Exhibit 6-5). Whereas more than one-third of youth (36%) who have independent living goals are reported to be making “a lot of progress” toward them, fewer than one-fourth of youth (23%) with vocationally oriented goals are reported to be making “a lot of progress” toward them, with 26% of youth with self-advocacy goals making “a lot of progress” toward those goals ( $p < .001$ ). The three types of goals are similar in the rate at which youth are reported to be making “no progress” (approximately 5% to 7%).

### **Assuming Responsibilities of Daily Living**

Another aspect of independence involves the extent to which youth with disabilities are taking responsibility for their daily living needs. Two of these needs are investigated in NLTS2: taking on responsibility for personal space, possessions, and needs in the household, and managing personal money.

### **Household Responsibilities**

As youth mature, they often are expected to become more responsible for their own support within the household, such as fixing their own breakfast or lunch, straightening up their rooms or living areas, and doing their own laundry. In addition, most youth begin to function more independently outside of the home (e.g., by shopping for personal items). These kinds of daily living responsibilities can measure youth's competence and independence.

Parents were asked how often youth fix their own breakfast or lunch, straighten up their living space, do laundry, and buy a few things at a store when they are needed. The frequency of performing these tasks was reported on a 4-point scale ranging from “never” to “always.”<sup>3</sup>

<sup>3</sup> NLTS2 findings related to responsibilities within the household are reported in greater detail in Cameto et al. (2003).

According to parents' reports, more than half of youth with disabilities usually or always fix their own breakfast or lunch (Exhibit 6-6), about 40% usually or always straighten up their room or buy a few things at the store, and about one-fourth usually or always do their laundry.

<b>Exhibit 6-6 HOUSEHOLD AND FINANCIAL RESPONSIBILITIES OF YOUTH WITH DISABILITIES</b>		
	Percentage	Standard Error
<b>Household responsibilities</b>		
Fixes own breakfast or lunch		
Always	32.0	1.5
Usually	22.8	1.3
Sometimes	37.1	1.5
Never	8.2	.9
Straightens up own room/living area		
Always	26.6	1.4
Usually	14.7	1.1
Sometimes	40.4	1.5
Never	18.3	1.2
Buys items needed at a store		
Always	25.3	1.4
Usually	17.0	1.2
Sometimes	41.5	1.6
Never	16.2	1.2
Does laundry		
Always	19.1	1.5
Usually	8.6	.9
Sometimes	32.9	1.5
Never	39.4	1.5
Household responsibilities scale score		
High (15 or 16)	6.9	.8
Medium (9 to 14)	58.1	1.6
Low (4 to 8)	35.0	1.5
<b>Financial management</b>		
Gets an allowance/has money and can decide how to spend it	83.5	1.2
Has a savings account	44.7	1.6
Has a checking account	3.2	.6
Has a charge account or credit card	3.0	.8
Source: NLTS2 Wave 1 parent interviews.		

About 40% of youth reportedly sometimes fix their own breakfast or lunch, straighten up their room, or buy a few things at the store, and about one-third sometimes do laundry. Only 8% of youth never fix their own breakfast or lunch, 18% of youth never straighten up their room, and 16% never buy things at the store. Doing laundry is the task least likely to be performed by youth, with about 40% never doing so. Although the extent to which youth perform these tasks may reflect their abilities and disabilities, it also may reflect other factors, such as youth's preferences, parental expectations, or family culture.

An overview of students' household responsibilities results from a summative scale of ratings of the frequency with which youth do the four activities described above. The scale ranges from 4 (all activities "never" done) to 16 (all activities "always" done). Almost 60% of youth score in the medium range on this scale, indicating that they usually or sometimes do these activities, and another 7% score in the high range, indicating that they almost always do them.

### Managing Personal Finances

Financial responsibility also is a key indicator of independence. As youth mature, they begin to become able to earn, spend, and save money and to be financially accountable. Traditionally, young people encounter the concept of money management through some form of

allowance and perhaps a savings account set up by their family. Opening a checking account or owning a credit card entails another level of monetary responsibility—debt and debt payment—which requires a greater degree of independence. To assess the extent to which youth with disabilities are acquiring these financial management responsibilities, parents were asked whether their adolescent children "get an allowance or have other money that he/she can decide

how to spend.” They also were asked whether each youth has a savings account, checking account, or a charge account or credit card in his or her own name.

The large majority (84%) of youth with disabilities are reported by their parents to receive an allowance or other personal spending money (Exhibit 6-6). Another 45% have a savings account. On the other hand, parents report that only 3% of their adolescent children with disabilities have checking accounts, charge accounts, or credit cards in their own names.

### Emerging Independence in the Community

In addition to increasing responsibility for personal business, many adolescents, with or without disabilities, also begin to acquire new roles and responsibilities in society. For adolescents with disabilities, the transition to independent participation in the community is challenged by numerous factors, including the economic climate, employment options, family support, personal resources, and functional ability, among others (Borgen & Amundson, 1995; Storey, Bates, & Hunter, 2002). Two aspects of independence in the context of community are investigated in NLTS2: earning driving privileges and having regular paid employment.

#### Earning Driving Privileges

Most states allow 15-year-olds to apply for learner’s permits that enable them to drive with an adult, and they permit 16-year-olds to take a test to earn independent driving privileges. License requirements beyond passing the written and driving tests vary from state to state (e.g., many require teens to have taken a formal driver education program), as do the privileges accorded teens of different ages (e.g., some states restrict the hours teens can drive and the passengers they can carry for the first 6 months of their driving career). This aspect of independence for youth with disabilities was assessed by asking parents of youth who were at least 15 years old whether their adolescent children with disabilities have a driver’s license or learner’s permit. According to parents, almost one-third (30%) of youth with disabilities age 15 or older have earned these driving privileges (Exhibit 6-7).

<b>Exhibit 6-7</b> <b>EMERGING INDEPENDENCE OF YOUTH WITH</b> <b>DISABILITIES IN THE COMMUNITY</b>		
	Percentage	Standard Error
Youth 15 years old or older with a learner’s permit or driver’s license	30.4	1.8
Youth with regular paid employment:		
During the past year	54.0	1.6
During the summer only	16.5	1.2
During the school year only	5.2	.7
During both summer and school year	32.2	1.5
Currently	21.8	1.3
Source: NLTS2 Wave 1 parent interviews.		

#### Regular Paid Employment

Regular paid employment during high school can be an important foundation for employment in the postschool years (Blackorby & Wagner, 1996; Rylance, 1998; Storey et al., 2002). According to parents, 54% of youth with disabilities are employed in regular paid jobs outside the home (other than work-study) at some time in a 1-year period, with 22% being employed at a given point in time (Exhibit 6-7).<sup>4</sup> One-third of youth with disabilities work during both the summer and the school year, with fewer (16%) working

<sup>4</sup> NLTS2 findings related to employment during secondary school are reported in more detail in Marder, Cardoso, Wagner. (2003).



only during the summer and still fewer (5%) working only during the school year.

## Relationships among Dimensions of Independence

As multiple dimensions of the broad concept of independence, the various indicators presented thus far are related to each other, but some more strongly than others. Looking first at the interrelationships of various indicators within each dimension of independence, analyses show that among the skills that support independence, self-care and functional cognitive skills and mobility are highly related (Exhibit 6-8), with correlations of .53 to .68 ( $p<.0001$ ). However, the ability to self-advocate is less strongly associated with other skills, with correlations ranging from .20 to .28 ( $p<.0001$ ), and the trait of persisting with tasks is least related to other skills (correlations of .12 to .19,  $p<.0001$ ).

**Exhibit 6-8**  
**CORRELATIONS AMONG SKILLS THAT SUPPORT THE INDEPENDENCE OF YOUTH WITH DISABILITIES**

	Functional Cognitive Skills	Mobility	Self- advocacy	Persistence
Self-care skills	.53	.56	.20	.12
Functional cognitive skills		.68	.28	.18
Mobility			.20	.12
Persistence				.19

All correlations are significant at the  $p<.0001$  level.

The three measures of progress toward independence goals are highly related, with correlations ranging from .52 to .60 (Exhibit 6-9;  $p<.0001$  for all correlations). The two dimensions of assuming responsibilities of daily living also are related, although less strongly; household responsibilities and the number of financial management responsibilities of youth are

correlated at .22 ( $p<.0001$ ). Lastly, the two measures of emerging independence in the community—earning driving privileges and having paid employment outside the home—are related. Overall, 41% of youth with disabilities who have regular paid jobs also have a driver's license or learner's permit, compared with 15% of those who do not work for pay outside the home ( $p<.001$ ).

In addition to each of these relationships among indicators of a particular dimension of independence, many relationships are significant across dimensions. Correlations between skills that support independence and progress toward independence-related goals range from .11 to .44 ( $p<.0001$ ). The ability to advocate for oneself is the skill most strongly related to progress toward independence goals, particularly toward the self-advocacy goal ( $r=.44$ ,  $p<.0001$ ). Skills that support independence are even more strongly related to youth's assuming responsibilities for daily living, with correlations ranging from .08 to .44 ( $p<.0001$ ). All correlations are stronger with household responsibilities than with financial management responsibilities, perhaps reflecting the physical abilities required for assuming household responsibilities and for mastering self-care, mobility, and some functional cognitive skills. Progress toward independence goals are weakly, but significantly, related to assuming responsibilities of daily living, with correlations of .07 to .18 ( $p<.0001$ ).

**Exhibit 6-9**  
**CORRELATIONS AMONG DIMENSIONS OF INDEPENDENCE AND SKILLS THAT**  
**SUPPORT THE INDEPENDENCE OF YOUTH WITH DISABILITIES**

	Progress Toward:			Extent to Which Youth Assumes Responsibilities for Daily Living	
	Independent Living Goals	Vocationally Oriented Goals	Self-advocacy Goals	Household Responsibilities	Financial Responsibilities
Skills that support independence					
Self-care skills	.22	.16	.16	.44	.27
Functional cognitive skills	.23	.16	.26	.43	.27
Mobility	.19	.11	.18	.43	.26
Self-advocacy	.30	.32	.44	.23	.16
Persistence	.09	.12	.12	.22	.08
Progress toward:					
Independent living goals	--	.56	.60	.18	.07
Vocationally oriented goals	--	--	.52	.16	.10
Self-advocacy goals	--	--	--	.18	.10
Extent to which youth assumes household responsibilities	--	--	--	--	.22

Source: NLTS2 Wave 1 parent interviews, general education teacher survey, and student's school program survey.

All correlations are significant at the  $p < .0001$  level.

Exhibit 6-10 depicts the relationships among emerging independence in the community and other dimensions of independence. With the exception of persistence and making progress toward self-advocacy goals, all measures of independence are significantly higher ( $p < .05$  to  $p < .001$  across measures) for youth with disabilities who have regular paid jobs than for youth who do not. Similarly, factors including measures of skills that support independence, school staff reports of progress toward goals, and average household responsibilities are all significantly higher for age-eligible youth who have a driver's license or permit than for those who do not have these privileges.

## Disability Differences in Independence

Youth with different primary disability classifications differ dramatically in the levels of independence achieved on each of the dimensions described thus far.

### Skills That Support Independence

Although large differences exist between youth with different primary disability classifications, the patterns of those differences are not uniform across the kinds of skills explored in NLTS2 (Exhibit 6-11). Self-care skills, functional cognitive skills, and mobility all vary greatly across categories; there are differences of about 48 percentage points for those rated as highly skilled in mobility across the categories. For all three dimensions of independence, youth with learning disabilities, speech impairments, emotional disturbances, hearing impairments, and other health impairments are the most likely to be rated as highly skilled.

**Exhibit 6-10**  
**SELECTED DIMENSIONS OF INDEPENDENCE OF YOUTH WITH DISABILITIES, BY**  
**EMPLOYMENT STATUS AND HAVING DRIVING PRIVILEGES**

	Youth Has a Regular Paid Job		Youth Has Driving Privileges	
	Yes	No	Yes	No
Skills that support independence				
Average self-care skills scale score	8.0 (.1)	7.7 (.1)	8.0 (.1)	7.8 (.1)
Average functional cognitive skills scale score	14.2 (.1)	13.0 (.1)	14.6 (.1)	13.2 (.1)
Percentage who get around outside the house "very well"	82.1 (1.8)	65.1 (2.2)	88.5 (2.5)	69.2 (2.1)
Percentage who persist with tasks "very often"	36.2 (2.2)	34.1 (2.1)	36.2 (3.7)	34.2 (2.1)
Percentage who self-advocate "very well"	27.0 (2.9)	18.2 (2.5)	31.7 (4.9)	19.5 (2.5)
Progress toward independence-related goals				
Percentage making "some" or "a lot of progress" toward:				
Independent living goals	85.7 (2.8)	68.9 (4.0)	65.7 (6.3)	32.4 (3.6)
Vocationally oriented goals	76.7 (3.4)	63.9 (4.0)	35.1 (5.9)	26.1 (3.3)
Self-advocacy goals	65.0 (3.8)	75.1 (3.5)	41.5 (.5)	21.1 (3.2)
Assuming responsibilities for daily living				
Average household responsibilities scale score	10.2 (.1)	9.4 (.1)	10.4 (.2)	9.8 (.1)
Average number of financial management responsibilities	.9 (.1)	.8 (.1)	.9 (.1)	.9 (.1)

Source: NLTS2 Wave 1 parent interviews, general education teacher survey, and student's school program survey.

Standard errors are in parentheses.

More than 90% of these youth score high on the self-care scale, 52% or more score high on functional cognitive skills, and 72% or more get around outside the house "very well." In contrast, youth with multiple disabilities or deaf-blindness are among the most likely to score in the lowest category on these scales. On self-care skills and mobility, they are joined by youth with orthopedic impairments. Regarding functional cognitive skills and mobility, youth with mental retardation, visual impairment, or autism also are among the least skilled.

A very different pattern is apparent regarding self-advocacy and persistence; for these skills, sensory or physical ability is not as relevant as for the other skills supporting independence. Across the disability categories, the percentage scoring at the highest level varies by 30 percentage points for self-advocacy and 27 percentage points for persistence. Youth with hearing or visual impairments are among the highest scoring; according to teachers, more than 30% of the youth in these two categories are able to self-advocate "very well", and at least 50% are persistent "very often." Although the results are consistent with the pattern of high self-care and functional cognitive skills and mobility for youth with hearing impairments, they are not consistent for youth with visual impairments, whose self-care skills, functional cognitive skills,

**Exhibit 6-11**  
**LEVELS OF SKILLS THAT SUPPORT INDEPENDENCE,**  
**BY DISABILITY CATEGORY**

	Learning Dis- ability	Speech/ Language Impair- ment	Mental Retar- dation	Emo- tional Distur- bance	Hearing Impair- ment	Visual Impair- ment	Ortho- pedic Impair- ment	Other Health Impair- ment	Autism	Trau- matic Brain Injury	Multiple Disabili- ties	Deaf- Blind- ness
Percentage with self-care skills scale score <sup>a</sup>												
High (8)	98.1 (.7)	96.0 (1.0)	80.9 (1.9)	96.7 (.9)	97.5 (.9)	73.2 (3.1)	50.5 (2.7)	90.5 (1.4)	52.9 (2.7)	76.7 (3.9)	53.4 (2.7)	56.0 (4.9)
Low (2 to 4)	.1 (.2)	.2 (.2)	4.0 (1.0)	.3 (.3)	.1 (.2)	6.3 (1.7)	17.8 (2.1)	.8 (.4)	6.6 (1.3)	4.5 (1.9)	21.7 (2.2)	14.9 (3.5)
Percentage with functional cognitive skills scale score <sup>a</sup>												
High (15 or 16)	52.3 (2.4)	61.6 (2.4)	20.4 (2.0)	62.7 (2.5)	56.0 (2.8)	33.4 (3.3)	40.3 (2.7)	53.0 (2.4)	24.6 (2.3)	46.4 (4.6)	15.8 (2.0)	20.4 (4.1)
Low (4 to 8)	1.5 (.6)	2.0 (.7)	22.6 (2.1)	2.5 (.8)	3.9 (1.1)	22.8 (3.0)	15.0 (2.0)	2.4 (.7)	28.6 (2.4)	8.2 (2.5)	40.4 (2.6)	33.1 (4.8)
Mobility—Percentage who get around outside the house <sup>b</sup>												
Very well	79.9 (2.0)	77.0 (2.1)	52.4 (2.6)	79.5 (2.1)	73.3 (2.6)	48.8 (3.6)	46.7 (2.9)	72.5 (2.1)	33.1 (2.7)	60.1 (4.6)	34.4 (2.7)	31.1 (4.8)
Not very or not at all well	4.1 (1.0)	5.8 (1.2)	22.0 (2.1)	4.6 (1.1)	.7 (1.5)	31.9 (3.4)	34.5 (2.7)	7.3 (1.2)	46.4 (2.9)	11.6 (3.0)	47.7 (2.8)	47.4 (5.1)
Self-advocacy—Percentage who ask for what they need to succeed in class <sup>b</sup>												
Very well	25.9 (2.7)	25.4 (2.8)	16.5 (2.4)	9.7 (2.4)	34.6 (3.6)	39.4 (4.8)	27.6 (3.1)	19.0 (2.4)	14.4 (2.4)	29.0 (5.4)	11.6 (2.4)	22.2 (5.5)
Not very or not at all well	33.6 (2.9)	30.2 (3.0)	40.8 (3.2)	50.3 (4.0)	21.1 (3.1)	24.3 (4.2)	30.8 (3.2)	37.5 (2.9)	56.7 (3.3)	31.3 (5.5)	49.7 (3.8)	33.1 (6.2)
Persistence—Percentage who keep working at something until finished <sup>c</sup>												
Very often	36.0 (2.3)	48.2 (2.4)	33.4 (2.4)	26.4 (2.2)	50.4 (2.9)	53.2 (3.5)	2.8 (2.7)	8.4 (2.1)	38.7 (2.6)	31.8 (4.3)	35.1 (2.6)	45.6 (5.0)
Never	13.9 (1.7)	10.2 (1.5)	20.1 (2.0)	26.2 (2.2)	11.0 (1.8)	9.4 (2.1)	16.9 (2.1)	19.5 (1.9)	18.5 (2.1)	16.6 (3.4)	23.5 (2.3)	17.6 (3.8)

Source: NLTS2 Wave 1 parent interviews, general education teacher survey, and student's school program survey.

<sup>a</sup> The "medium" category is omitted.

<sup>b</sup> The category "well" is omitted.

<sup>c</sup> The category "sometimes" is omitted.

Standard errors are in parentheses.

and level of mobility are not particularly high. Patterns of mixed scores characterize other groups of youth, as well. For example, youth with deaf-blindness are among the most likely to demonstrate frequent persistence, but they are among the lowest scoring on all other skills that support independence. Conversely, youth with emotional disturbances are the least likely to be persistent or self-advocate "very often," but their scores are among the highest on self-care and functional cognitive skills and mobility.

## **Transition Planning and Goals**

There is significant variation across disability categories in students' participation in their own transition planning and in school staff reports of their progress toward independence-related goals (Exhibit 6-12). For example, one-fourth of students with visual impairments are reported to have a leadership role in transition planning, as are 18% of students with hearing or orthopedic impairments. In contrast, 2% to 3% of students with mental retardation, autism, or multiple disabilities are that active in their transition planning ( $p < .05$  to  $p < .001$  compared with all other categories); in fact, from 45% to 67% of youth in these categories either do not attend transition planning meetings or attended but do not participate.

Regarding progress toward goals, school staff are most likely to rate youth with learning disabilities; speech, hearing, or visual impairments; or traumatic brain injuries as making "a lot of progress." One-third or more in these categories are rated as making "a lot of progress" toward independent living goals, and from about one-fourth to one-third are rated as making this degree of progress toward vocationally oriented goals. Students in these categories also generally are making substantial progress toward self-advocacy goals, as are youth with orthopedic impairments.

Although relatively few youth in any category are rated as making "no progress" toward independent living goals, differences across categories are significant. Youth with multiple disabilities are the most likely to be rated as making no progress toward independent living goals (13%), and those with autism are most likely to be making no progress toward self-advocacy goals (18%); these are significantly more likely than youth with learning disabilities or hearing impairments ( $p < .01$  and  $.05$ ). Differences among categories in the percentage of youth reported to be making "no progress" toward vocationally oriented goals are not significant.

## **Assuming Responsibilities for Daily Living**

Disability category differences are apparent in the assumption of household responsibilities and management of personal finances (Exhibit 6-13). Although parents of 9% or fewer of youth in any disability category score youth high on the household responsibilities scale, there are significant differences among groups, with youth with hearing impairments being the most likely to score high (9%) and those with autism the least likely (2%,  $p < .001$ ). Larger differences are seen among low scorers, which include from 56% to 63% for youth with orthopedic impairments, autism, or multiple disabilities. In contrast, about 30% of youth with learning disabilities or speech impairments score low ( $p < .001$  for all comparisons).

There is about a 26-percentage-point difference across categories for youth's having an allowance or other money about which they make decisions and for having a savings account. About 85% or more of youth with learning disabilities, hearing or other health impairments, or traumatic brain injuries have such funds. With the exception of those with learning disabilities, they, along with youth with speech or visual impairments, also are among the most likely to have a savings account (from 51% to 59%). Youth with hearing or visual impairments also are significantly more likely to have a checking account (6%), as are their peers with traumatic brain injuries ( $p < .05$  for hearing or visual impairments, compared with mental retardation or emotional

**Exhibit 6-12**  
**YOUTH'S TRANSITION PLANNING PARTICIPATION AND PROGRESS**  
**TOWARD TRANSITION GOALS, BY DISABILITY CATEGORY**

	Learning Dis- ability	Speech/ Language Impair- ment	Mental Retar- dation	Emo- tional Distur- bance	Hearing Impair- ment	Visual Impair- ment	Ortho- pedic Impair- ment	Other Health Impair- ment	Autism	Trau- matic Brain Injury	Multiple Disabili- ties	Deaf- Blind- ness
Percentage reported to take part in transition planning:												
In a leadership role	14.6 (2.5)	9.4 (2.5)	3.3 (1.3)	10.8 (2.9)	17.7 (3.4)	24.9 (4.7)	17.5 (3.1)	10.3 (2.2)	2.6 (1.2)	13.7 (4.8)	2.3 (1.3)	11.8 (4.6)
Not present or present and not participating	24.9 (3.0)	31.5 (3.9)	47.0 (3.6)	36.4 (4.3)	22.8 (3.6)	24.5 (4.7)	29.8 (3.6)	21.1 (2.8)	67.3 (3.5)	30.1 (6.0)	61.8 (4.3)	45.2 (7.1)
Percentage with progress toward independent living goal:												
A lot of progress	42.2 (3.9)	38.5 (4.9)	21.1 (3.1)	28.0 (4.5)	33.5 (4.5)	33.0 (5.7)	24.9 (3.9)	29.9 (3.6)	15.4 (3.2)	37.6 (7.3)	21.5 (4.1)	24.9 (7.2)
No progress	3.9 (1.5)	5.4 (2.3)	6.4 (1.9)	8.3 (2.7)	1.9 (1.3)	6.2 (2.9)	7.6 (2.4)	7.4 (2.1)	10.2 (2.7)	5.8 (3.5)	12.6 (3.3)	3.8 (3.2)
Percentage with progress toward a vocationally oriented goal:												
A lot of progress	25.1 (3.3)	25.5 (4.2)	19.0 (3.0)	17.3 (3.7)	26.0 (4.2)	26.6 (5.1)	24.0 (3.9)	19.8 (3.0)	16.1 (3.0)	33.0 (7.2)	20.7 (3.8)	11.2 (5.0)
No progress	4.7 (1.6)	7.9 (2.6)	6.5 (1.9)	9.8 (2.9)	3.5 (1.8)	4.1 (2.3)	7.1 (2.4)	6.6 (1.9)	6.5 (2.0)	4.9 (3.3)	9.0 (2.7)	3.4 (2.9)
Percentage with progress toward a self-advocacy goal:												
A lot of progress	29.4 (3.7)	30.5 (4.6)	14.0 (2.8)	22.2 (4.1)	32.3 (4.8)	41.3 (6.0)	30.1 (4.2)	24.1 (3.5)	12.3 (2.9)	25.6 (7.0)	16.0 (3.7)	20.4 (6.6)
No progress	3.7 (1.5)	8.7 (2.8)	11.2 (2.5)	12.5 (3.2)	5.5 (2.3)	6.1 (2.9)	8.4 (2.5)	7.2 (2.1)	18.1 (3.4)	7.6 (4.3)	15.9 (3.7)	6.8 (4.1)

Source: NLTS2 Wave 1 school program survey.

Notes: The categories "some progress" and "a little progress" are omitted.  
Progress toward a goal is reported only for youth with that kind of goal.  
Standard errors are in parentheses.

disturbance). In contrast, 67% or fewer youth with autism, multiple disabilities, or deaf-blindness have an allowance ( $p < .001$  for all comparisons), and 40% or fewer youth with mental retardation, emotional disturbances, or deaf-blindness have a savings account ( $p < .01$  for youth with emotional disturbances vs. those with hearing impairments).

### Emerging Independence in the Community

Across indicators, the highest levels of emerging community independence are apparent for youth with learning disabilities, speech impairments, or other health impairments (Exhibit 6-14). Along with youth with hearing impairments, more than one-third of these youth have earned driving privileges, according to parents, compared with one-fourth or fewer of youth in other categories (e.g.,  $p < .05$  for learning disability vs. traumatic brain injury). Employment rates also tend to be higher for these youth. For example, half or more of them, as well as youth with

emotional disturbances, have been employed at some time in a 1-year period, with their rates of employment similar to or somewhat exceeding those of the general population of youth (Marder, Cardoso, et al., 2003).

**Exhibit 6-13**  
**YOUTH'S HOUSEHOLD AND FINANCIAL RESPONSIBILITIES,**  
**BY DISABILITY CATEGORY**

	Learning Dis- ability	Speech/ Language Impair- ment	Mental Retar- dation	Emo- tional Distur- bance	Hearing Impair- ment	Visual Impair- ment	Ortho- pedic Impair- ment	Other Health Impair- ment	Autism	Trau- matic Brain Injury	Multiple Disabili- ties	Deaf- Blind- ness
Percentage with household responsibilities scale score: <sup>a</sup>												
High (15 or 16)	7.4 (1.3)	5.7 (1.1)	7.4 (1.3)	6.3 (1.2)	8.6 (1.6)	4.7 (1.5)	4.2 (1.1)	3.6 (0.9)	1.5 (.6)	6.9 (2.3)	2.7 (.9)	6.3 (2.4)
Low (4 to 8)	30.8 (2.3)	30.1 (2.3)	43.3 (2.5)	39.8 (2.5)	26.3 (2.5)	40.1 (3.5)	63.0 (2.7)	41.4 (2.3)	56.2 (2.6)	36.0 (4.4)	63.4 (2.6)	48.5 (5.0)
Percentage who have:												
An allowance or other money and can decide how to spend it	85.3 (1.7)	81.9 (1.9)	79.0 (2.1)	82.2 (2.0)	88.1 (1.9)	77.5 (2.9)	77.8 (2.3)	86.8 (1.6)	65.0 (2.6)	84.9 (3.2)	62.3 (2.6)	67.3 (4.9)
A savings account	45.9 (2.5)	52.3 (2.5)	33.9 (2.4)	40.2 (2.5)	52.1 (2.9)	51.3 (3.5)	49.0 (2.8)	57.2 (2.4)	47.9 (2.7)	59.0 (4.4)	42.3 (2.7)	39.5 (5.1)
A checking account	3.5 (.9)	4.0 (1.0)	1.7 (.7)	2.1 (.7)	5.7 (1.3)	5.7 (1.6)	2.7 (.9)	4.7 (1.0)	3.5 (1.0)	5.7 (2.1)	2.9 (.9)	2.4 (1.6)
A charge account or credit card	3.9 (1.4)	3.1 (1.6)	1.6 (.9)	.6 (.6)	3.6 (1.6)	3.0 (1.9)	1.6 (1.1)	2.9 (1.2)	.7 (.8)	1.7 (1.4)	1.0 (.8)	1.9 (2.3)

Source: NLTS2 Wave 1 parent interviews.

<sup>a</sup> The category "medium" is omitted.

Standard errors are in parentheses.

**Exhibit 6-14**  
**YOUTH'S EMERGING INDEPENDENCE IN THE COMMUNITY,**  
**BY DISABILITY CATEGORY**

	Learning Dis- ability	Speech/ Language Impair- ment	Mental Retar- dation	Emo- tional Distur- bance	Hearing Impair- ment	Visual Impair- ment	Ortho- pedic Impair- ment	Other Health Impair- ment	Autism	Trau- matic Brain Injury	Multiple Disabili- ties	Deaf- Blind- ness
Youth of appropriate age has driving permit or license	36.5 (2.9)	35.2 (3.2)	8.8 (1.7)	24.8 (2.6)	33.1 (3.2)	9.7 (2.6)	16.7 (2.5)	35.8 (2.8)	8.8 (2.0)	25.0 (4.9)	8.7 (1.9)	13.1 (4.5)
Percentage with a regular paid job:												
In the past year	60.1 (2.4)	49.7 (2.5)	35.9 (2.5)	52.6 (2.6)	47.4 (2.9)	35.7 (3.4)	27.4 (2.5)	56.0 (2.4)	14.5 (1.9)	43.6 (4.5)	21.5 (2.2)	22.5 (4.5)
Currently	25.1 (2.1)	22.0 (2.1)	11.7 (1.8)	19.1 (2.0)	22.1 (2.4)	15.1 (2.5)	9.6 (1.7)	23.8 (2.0)	5.2 (1.2)	17.8 (3.5)	8.1 (1.5)	7.8 (2.8)

Source: NLTS2 Wave 1 parent interviews.

Standard errors are in parentheses.

Youth with autism, multiple disabilities, and deaf-blindness present a contrasting pattern. They are among the least likely to be independent in the ways measured here. Regarding driving

privileges, they are joined by youth with visual or orthopedic impairments as being particularly unlikely to be driving, although 10% to 17% of youth in these categories do so. In the employment arena, 14% of youth with autism and fewer than one-fourth of those with multiple disabilities or deaf-blindness are employed in a given year. Their rates of current employment, along with those of youth with orthopedic impairments or mental retardation, also are low relative to other youth (e.g.,  $p < .05$  for multiple disabilities vs. emotional disturbance).

## **Factors Related to Independence of Youth with Disabilities**

Multivariate analyses were performed to investigate the independent relationships of disability and a variety of other individual, household, and school program factors to emerging independence. Two measures of independence were used: independent performance of household chores and regular paid employment outside of school.

### **Individual Characteristics**

The relationship of three kinds of individual characteristics—disability, functioning, and demographics—are considered as they relate to emerging independence.

**Disability characteristics.** Controlling for other factors, disability category is a significant factor related to performance of household responsibilities or holding a regular paid job for all youth with disabilities, with the exception of those with speech impairments (Exhibit 6-15). For example, relative to youth with learning disabilities,<sup>5</sup> having an orthopedic impairment is negatively related to both carrying out household responsibilities and holding a job. Youth with orthopedic impairments score a full point below youth with learning disabilities on household responsibilities, other factors held constant, and are 21 percentage points less likely to have a paid job outside of school.

Compared with youth with learning disabilities, more differences are observed for youth in other disability categories regarding employment than household responsibilities, and differences generally favor youth with learning disabilities. Only youth with hearing impairments are more likely than youth with learning disabilities to demonstrate independence in performing household responsibilities, other factors being equal, whereas youth with emotional disturbances or orthopedic or other health impairments are somewhat less likely than youth with learning disabilities to carry out household responsibilities. Youth with mental retardation, visual or orthopedic impairments, autism, or multiple disabilities all are less likely than youth with learning disabilities to hold jobs, with differences of 10 to 30 percentage points, other factors held constant. In contrast, having ADD/ADHD, independent of the primary disability category, is positively related to the likelihood of youth's having a job.

Additionally, the number of functional domains in which youth experience problems related to disability is strongly related to their independence, favoring youth with fewer areas of functional limitation. The age of the youth at the time that his/her disability was identified is related to the likelihood of having a job, favoring youth identified at a later age.

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<sup>5</sup> Multivariate analyses require that for categorical variables, such as disability category, each category be compared with another specified category. Learning disability was chosen as the category against which to compare the relationships for other disability categories because it is the largest category and, therefore, most closely resembles the characteristics of youth with disabilities as a whole.



**Exhibit 6-15**  
**DIFFERENCES IN INDEPENDENCE ASSOCIATED WITH INDIVIDUAL**  
**CHARACTERISTICS OF YOUTH WITH DISABILITIES<sup>a</sup>**

	Estimated Difference in:		
	Household Responsibilities Scale Score	Probability of Having Regular Paid Employment	For Increment
<b>Disability characteristics</b>			
Speech/language impairment	.0	-3.3	vs. learning disability <sup>b</sup>
Mental retardation	.1	<b>-10.5**</b>	vs. learning disability
Emotional disturbance	<b>-.3*</b>	-4.9	vs. learning disability
Hearing impairment	<b>.5***</b>	-8.2	vs. learning disability
Visual impairment	.2	<b>-19.1***</b>	vs. learning disability
Orthopedic impairment	<b>-1.0***</b>	<b>-21.3***</b>	vs. learning disability
Other health impairment	<b>-.4***</b>	-7.3	vs. learning disability
Autism	-.1	<b>-29.9***</b>	vs. learning disability
Traumatic brain injury	.1	-12.3	vs. learning disability
Multiple disabilities/deaf-blindness	-.1	<b>-17.2***</b>	vs. learning disability
ADD/ADHD	-.1	<b>7.2**</b>	Yes vs. no
Age at identification of disability	.0	<b>2.5**</b>	8 vs. 4 years
Number of problem domains	<b>-.2***</b>	<b>-6.5***</b>	3 vs. 1 domain
<b>Functioning</b>			
Health	.2	2.5	Excellent vs. fair or poor (4 vs. 1)
Self-care skills	<b>2.1***</b>	<b>24.4***</b>	High vs. low (8 vs. 4)
Functional cognitive skills	<b>1.1***</b>	<b>16.8***</b>	High vs. low (15 vs. 7)
Social skills	<b>.6***</b>	<b>5.6*</b>	High vs. low (27 vs. 17)
Persistence	<b>.9***</b>	-3.0	High vs. low (3 vs. 1)
<b>Demographics</b>			
Age	<b>.7***</b>	<b>17.3***</b>	17 vs. 14 years
Gender	<b>-.7***</b>	-.7	Male vs. female
African American	<b>.5***</b>	<b>-15.4***</b>	vs. white
Hispanic	.2	<b>-19.5***</b>	vs. white
Other or multiple race/ethnicity	.2	<b>-14.3*</b>	vs. white
Primarily language other than English spoken at home	.1	-1.7	Yes vs. no

<sup>a</sup> Statistics in this exhibit are calculated from models that included all individual characteristics shown in this exhibit, as well as household characteristics (results shown in Exhibit 6-16) and school programs and experiences (results shown in Exhibit 6-17).

<sup>b</sup> Multivariate analyses require that for categorical variables, such as disability category, each category be compared with another specified category. Learning disability was chosen as the category against which to compare the relationships for other disability categories because it is the largest category and, therefore, most closely resembles the characteristics of youth with disabilities as a whole.

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

Exhibit reads: The household responsibilities scale scores of youth with hearing impairments are .5 higher than the scores of youth with learning disabilities, other factors being equal. The scores of youth with high self-care skills are 2.1 points higher than the scores of youth with low self-care skills. The probability of having regular paid employment is 10.5 percentage points lower for youth with mental retardation than for youth with learning disabilities. The probability of having regular paid employment is 16.8 percentage points higher for youth whose functional cognitive skills are high than for youth whose functional cognitive skills are low.

**Functioning.** The relationship between the measures of individual functioning and independence is very strong. It is quite plausible that the better young people can care for their personal self-care needs, the better they are able to perform the somewhat more complex tasks involved in household responsibilities, such as making breakfast, cleaning up, or doing laundry. Greater persistence is a quality that is positively associated with higher performance on household chores. Youth with better cognitive and social skills also are more likely to perform household tasks with greater facility. Along with basic cognitive skills, self-care skills serve youth well in attaining jobs. Youth with high self-care and cognitive skills are 24 and 17 percentage points, respectively, more likely to have a job than youth with low skills.

**Demographic characteristics.** Age is among the strongest influences on the employment patterns of youth in the general population (Herz & Kosanovich, 2000; Rothstein & Herz, 2000). As youth mature, they are expected to enter the world of work and take on greater responsibility in the performance of tasks of daily living, including household chores. Similarly, for youth with disabilities, age is strongly related to employment, as well as to taking on household responsibilities. As noted in other NLTS2 analyses of employment of youth with disabilities (Marder, Cardoso, & Wagner, 2003), youth are more likely to be employed with each additional year in age; 17-year-olds are 17 percentage points more likely to have a job than 14-year-olds, other factors held constant. Race/ethnicity also has a strong independent relationship to the likelihood of employment for youth. Compared with white youth, youth in every other ethnic category are less likely to be employed, by 14 to 20 percentage points. Also, as stereotypical gender roles would suggest, girls are more likely than boys to take responsibility for tasks within the home, although gender does not have an effect on the likelihood of employment, independent of other factors included in the analyses.

### **Household Characteristics**

Various aspects of youth's households are related to their independence, although not consistently across the two indicators of household responsibilities and employment (Exhibit 6-16). Other things being equal, youth from lower-income families are more likely than those from higher income families to be responsible for household tasks. This is consistent with findings that youth from lower-income families are subject to more household rules (Newman, Wagner, & Guzman, 2002). Among families who expect that youth eventually will live away from home, youth are more likely to perform household tasks. Youth whose families are involved with their lives outside the home, specifically with their schools, also are more likely to have a job.

**Exhibit 6-16**  
**DIFFERENCES IN INDEPENDENCE ASSOCIATED WITH HOUSEHOLD**  
**CHARACTERISTICS OF YOUTH WITH DISABILITIES<sup>a</sup>**

	Estimated Difference in:		
	Household Responsibility Scale	Probability of Having Regular Paid Employment	For Increment
Household income	<b>-.2***</b>	1.4	\$55,000 to \$60,000 vs. \$20,000 to \$24,000
Family involvement at home	.0	NA	High vs. low (8 vs. 5)
Family involvement at school	NA	<b>8.5***</b>	High vs. low (6 vs. 1)
Expectations for eventually living away from home	<b>.9***</b>	NA	Definitely will vs. probably won't (4 vs. 2)

<sup>a</sup> Statistics in this exhibit are calculated from models that included the household characteristics shown in this exhibit, as well as individual characteristics (results shown in Exhibit 6-15), and school programs and experiences (results shown in Exhibit 6-17).

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

Exhibit reads: The household responsibilities scale scores of youth whose household incomes are between \$55,000 and \$60,000 are .2 lower than the scores of youth whose household incomes are between \$20,000 and \$24,000, other factors being equal. The probability of having regular paid employment is 8.5 percentage points higher for youth whose families have high levels of involvement with their school than for youth whose families have low levels of involvement.

### **School Programs and Experiences**

NLTS2 analyses of the independence of youth with disabilities have not examined the relationships between school programs and experiences and household responsibilities because the activities of home and school are considered to be relatively independent. However, the analyses have considered the relationships of school programs and experience with the employment of youth. Few measures of school programs and experiences have strong associations with youth's having a regular paid job outside of school (Exhibit 6-17). None of the vocational services provided as part of the youth's school program (e.g., vocational education, career counseling, Tech Prep programs) are associated with youth employment, other factors held constant.

Youth who have changed schools more often, other than because of grade promotions, are more likely to have a job. Perhaps in light of their transient engagements in individual schools, they focus on the world of work rather than on school. Social adjustment supports, such as behavior management plans or services from a behavior specialist, are negatively related to youth's having a job. This negative relationship may result from a spurious correlation, assuming that both receipt of social supports and low probability of having a job result, at least in part, from poor social adjustment. Future longitudinal analyses should be able to illuminate whether receipt of social supports helps youth gain employment over time.

**Exhibit 6-17**  
**DIFFERENCES IN INDEPENDENCE ASSOCIATED WITH SCHOOL PROGRAMS**  
**AND EXPERIENCES OF YOUTH WITH DISABILITIES<sup>a</sup>**

	Estimated Difference in Probability of Regular Paid Employment	For Increment
School mobility	<b>11.2**</b>	Changed school 3 times vs. not at all, except for promotions
Vocational education	.7	Yes vs. no
Number of vocational services	4.2	Four vs. none
School-sponsored work experience	-6.8	Yes vs. no
Number of social adjustment supports	<b>-3.1*</b>	Two vs. none

<sup>a</sup> Statistics in this exhibit are calculated from models estimated with the school programs and experiences shown in this exhibit, as well as individual characteristics (results shown in Exhibit 6-15), and household characteristics (results shown in Exhibit 6-16).

\*p<.05, \*\*p<.01, \*\*\*p<.001.

Exhibit reads: The probability of having regular paid employment is 11.2 percentage points higher for youth who have changed school three times, except for promotions, than for youth who have not changed schools at all, except for promotions, other factors being equal. The probability of having regular paid employment is 3.1 percentage points lower for youth who have two social adjustment supports than for youth who have no social adjustment supports.

### How Much Is Explained?

The multivariate analyses of measures of independence explain a statistically significant portion of the variation in household responsibilities ( $r^2=.38$ ) and youth employment ( $PI=.24$ ).<sup>6</sup> Almost all the explanatory power of the models of both types of emerging independence comes from the individual characteristics of youth with disabilities. Household characteristics increase the amount of variation explained in household responsibilities by only 1 percentage point. Similarly, household characteristics increase the PI of the model of probability of employment by 1 percentage point, and school programs and experiences by 2 percentage points. The fact that school programs and experiences result in such a small increase in the predictive power of the model should not be taken to mean that these programs and experiences make no difference to youth's probability of employment. Even if such programs and experiences have little impact on employment in the same year they are provided, they may have more impact in later years, a phenomenon that NLTS2 will explore in future reports.

### Looking Back to NLTS

A number of the factors related to employment that are included in these multivariate analyses were subjected to similar analyses in the original NLTS. However, a note of caution is needed regarding the comparison of the two analyses. NLTS analyses examined the relationship of multiple factors to employment of youth who were at least 16 years of age and no longer in school. In contrast, Wave 1 NLTS2 data include youth between the ages of 13 and 17, the vast

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<sup>6</sup> Because logistic regression analyses do not produce the typical measure of explained variation ( $r^2$ ) an alternative statistic was calculated for the employment analysis, which indicates the "predictive improvement," or PI, that can be obtained by adding an independent variable to a logistic regression. Possible PI values range from 0 to 1 in a similar way to conventional  $r^2$  statistics. See Appendix A for a more complete description of PI.

majority of whom were still in school. Nevertheless, comparison of the results reveals several similarities.

The 12-month employment rate for youth with disabilities increased between 1987 and 2001 by 9 percentage points ( $p < .01$ ; Wagner, Cameto, & Newman, 2003). Nonetheless, the relationships of disability to youth employment were consistent in both 1987 and 2001 for youth with speech impairments, mental retardation, emotional disturbances, or visual or orthopedic impairments. Employment of youth with speech impairments or emotional disturbances remains similar to that of youth with learning disabilities. The employment challenges of youth with mental retardation or with visual or orthopedic impairments have continued over time, with these youth continuing to be less likely to have a job than youth with learning disabilities. Positive changes have been found for youth with hearing or other health impairments.<sup>7</sup> In 1987, youth in both these categories were significantly less likely than youth with learning disabilities to be employed. In 2001, the difference in the rate of employment for youth with hearing or other health impairments and for youth with learning disabilities was no longer significant, other factor held constant. However, the addition of several aspects of functioning to the analyses in 2001 that were not available for inclusion in 1987 could explain these differences.

The relationships of individual functioning, specifically self-care and cognitive mental skills, remain stable over time. Higher functioning is associated with a greater likelihood of employment. A difference is noted between 1987 and 2001 regarding the relationship of gender and employment. In 1987, males were significantly more likely to be employed than females, other factors being equal. In 2001, no independent relationship existed between gender and the rates of employment.

A comparison of analyses of school factors such as taking vocational education or having work experience in 1987 and 2001 would be premature because youth in NLTS2 are, for the most part, still involved in their education and preparation for employment and adult life.

## Summary

Over the past several decades, a notable change has occurred in favor of the perspective that youth with disabilities are capable of determining their own futures. NLTS2 has investigated a variety of factors affecting the emerging independence of these youth, including skills that support and strengthen self-reliance, responsibilities that accompany an independent lifestyle, and activities associated with emerging independence.

Many youth have acquired skills to support independence, including those involving self-care, cognitive processing of information, mobility, and self-determination. Virtually all youth with disabilities have high self-care skills. About half of youth with disabilities have high functional cognitive skills, and only a small percentage do poorly in regard to these skills. About three-fourths of youth are reported to get around their neighborhoods “very well.” The self-determination skills involving persistence and asking for what one needs also are demonstrated by more than half of youth with disabilities.

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<sup>7</sup> When the original NLTS analyses were conducted, the federal disability category “other health impairment” included youth with autism. For this analysis only, youth with autism were included in the “other health impairment” category of NLTS2 so that the categories from the two studies would be commensurate.

Assuming responsibilities of daily living often is an expectation of youth as they mature. NLTS2 investigated the extent to which youth with disabilities have become responsible for a variety of typical tasks in the home and community, and for managing personal money. More than half of youth with disabilities always or usually prepare their own breakfast and lunch, and almost as many shop on their own, demonstrating emerging independence. Similar percentages are performing these tasks at least occasionally in the process of acquiring greater independence at home. Most youth have some experience managing their own money, but few have yet acquired the higher levels of financial management skills required to manage checking accounts or credit cards.

NLTS2 investigated two aspects of independence in the context of community: earning driving privileges and having regular paid employment. About one-third of age-eligible youth have acquired a driver's license or permit, and more than half of youth have been employed at some time during a 1-year period.

The factors that have the greatest effects on youth's acquisition of independence are their individual characteristics and capabilities. The specific nature of their disabilities, functional skills, and demographic characteristics are powerfully associated with their emerging independence.

Clearly, many youth with disabilities are making progress toward achieving independence. This conclusion is confirmed by school staff reports of youth's progress toward their goals for transition to adult life. Youth have made the greatest progress on independent living goals, but their achievements toward goals of employment and self-advocacy also are notable.

## **7. YOUTH WITH DISABILITIES, HOW ARE THEY DOING?**

**By Mary Wagner**

More than a decade ago, the original National Longitudinal Transition Study (NLTS) provided data to permit a national look at the secondary school and early transition experiences of youth with disabilities for the first time and to ask the question “How are they doing?” (Wagner et al., 1991). Analyses across multiple outcome domains revealed a “mixed bag of transition experiences,” which led the study team to wonder “whether the transition outcomes of youth with disabilities are represented by a glass that is half empty or half full” (Wagner, 1991d, p. 11-1). This current report also addresses the question of how youth with disabilities are doing in their secondary school years, and also finds a diversity of experiences, as well as some important differences from findings in 1991.

This chapter summarizes how youth with disabilities are doing in the early 21st century. Important differences in the outcomes for youth who differ in their primary disability classification also are noted. A look across outcome domains then identifies aspects of individual youth, their households, and their school programs and experiences that relate to the outcomes they achieve. Finally, opportunities to support positive outcomes for youth with disabilities in their secondary school years are highlighted.

### **Youth Outcomes—A Glass Half Empty or Half Full?**

The question of whether the “glass” of outcomes for secondary-school-age youth with disabilities is half empty or half full is almost as difficult to answer now as in 1991. Both indications of real achievement and causes for concern are apparent across the outcome domains of school engagement, academic performance, social adjustment, and independence.

A look at the lives of youth with disabilities at school reveals that most of them like school, according to parents, and many youth are doing well there, as measured by grades. Almost one-third are reported to receive mostly As and Bs, and about 70% receive at least Cs or above. At the same time, test scores for youth with disabilities show them to be an average of more than 3 years behind grade level in both their reading and mathematics abilities. Youth with disabilities who are in general education academic classes tend to be less far behind than their peers in special education classes, and virtually all of them are expected to keep up with the rest of the class. However, almost one-fourth fail to do so, according to teachers. On the other hand, more than three-fourths do keep up with their general education peers. Nonetheless, their skill deficits do not bode well for them in meeting state graduation standards or achieving college entrance examination scores that will enable them to pursue postsecondary education.

In the social domain, youth with disabilities as a group are considered to have fairly good social skills, according to parents; more than 80% are rated in the medium or high range on a scale of overall social skills. Almost two-thirds of youth with disabilities belong to organized groups at school or in the community, and a similar percentage see friends in informal get-togethers at least weekly. Overall, about one in seven youth have neither of these forms of social engagement outside of class. At school, even though teachers report that 90% of youth with disabilities get along well with other students and three-fourths or more follow directions and

control their behavior to act appropriately in class, more than a third were subject to disciplinary actions at school in the 2001-02 school year. Thirteen percent of youth with disabilities also get in enough trouble outside of school to have been arrested.

Youth with disabilities show signs of emerging independence in their personal behaviors, at home and in the community. They are beginning to demonstrate important self-determination skills; parents report that more than one-third persist in completing tasks “very often,” and teachers report that more than one in five advocate for their own interests “very well.” Virtually all youth with disabilities are able to take care of their personal care needs, and about half are reported by parents to be able to do common cognitive processing tasks, such as counting change and telling time, “very well.” Nonetheless, these activities remain challenging to some degree for about half of youth with disabilities. More than half of them have regular paid jobs at some time in a 1-year period, and 70% or more are reported to be making at least some progress toward goals related to work, independent living, and self-advocacy.

So in summing up, what can be made of this diversity of experience? The answer depends in part on the yardstick against which outcomes are measured. The experiences of youth in the general population are one standard by which to assess those with disabilities, and they are used throughout this report where comparable data exist for the two groups. However, using this standard does not give an unequivocal view of whether youth with disabilities are doing well or poorly.

In the independence domain, youth with disabilities have a 1-year employment rate that is essentially equivalent to that of youth in the general population, a positive finding in that employment during high school is powerfully related to the ability to find employment in the postschool years (Rothstein & Manser, 2000). On the other hand, youth with disabilities have lower social skills than youth in the general population, which is a cause for concern. As summarized below, better social skills are positively related to a variety of indicators across the outcome domains. The poorer social skills of youth with disabilities may help explain why they have less active friendships than the general population of youth. Although their skills deficit does not appear to relate to lower levels of organized group memberships or higher levels of arrest than those of youth in the general population, it raises the question whether the negative implications of poor social skills will accumulate as youth with disabilities age. Youth with disabilities also tend to like school less than their nondisabled peers do; although the two groups are about equally likely to be absent from school frequently, negative attitudes toward school could affect other school experiences and ultimately the dropout rate.

Another standard by which one could assess the diversity of achievements of youth with disabilities is the experiences of a similar group in the past. Although some of the outcomes reported for youth with disabilities now were not assessed in NLTS, comparisons of those outcomes that were measured for youth represented in NLTS and in NLTS2 reveal both positive and cautionary results.

In the independence domain, comparisons reveal modest, though statistically significant declines in the ability to manage self-care needs and in functional cognitive skills (Wagner, Cameto, et al., 2003). Yet these skill declines do not appear to show up elsewhere. The frequency with which youth with disabilities take on household responsibilities has not changed markedly over time, but there has been an increase in the rate at which youth with disabilities have their own money about which they can make decisions (Wagner, Cameto, et al., 2003).



Some of this increased responsibility for managing personal finances may result from a significantly higher rate of regular paid employment among youth with disabilities represented in NLTS2 than among those represented in NLTS. This clear advancement in holding regular paid jobs by youth with disabilities has closed the employment gap between these youth and youth in the general population that existed in the past.

At school, results also are mixed. Absenteeism has increased significantly over time; whereas NLTS found that youth with disabilities missed an average of 15 days of school in a year (Wagner, Newman, & Cameto, forthcoming), NLTS2 findings show an average absenteeism of 23 days. The length of the school year has increased in some states in the intervening years, resulting in a larger pool of school days to miss. Still, increased absenteeism among youth with disabilities suggests that they have greater gaps in their exposure to curriculum, with potential negative consequences for learning. Despite increased absenteeism, grades also have increased (Wagner, Newman, & Cameto, forthcoming), despite the fact that many more youth with disabilities are taking more of their courses in general education classrooms, with their typically higher grading standards relative to special education settings. However, the average gap of more than three grade levels between students' tested reading and math abilities and their actual grade levels has not declined over time.

On the social adjustment front, the rate at which youth with disabilities belong to organized groups has remained stable over time. However, the frequency with which they experience negative consequences for their behavior, in terms of disciplinary actions at school, arrests, or being fired from a job, has increased (Wagner, Cameto, et al., 2003).

From this summary of the outcomes of youth with disabilities, it is clear that their achievements can continue to be characterized as “a mixed bag,” as they were more than a decade ago.

## **What Makes a Difference?**

As depicted by a variety of outcome measures across multiple outcome domains, youth with disabilities experience the full range of possible experiences, from high achievement to significant struggles. What accounts for that variation in experience? What factors help explain why some youth with disabilities do well while others are not succeeding in dealing with the challenges they face? Multivariate analyses suggest that characteristics of youth themselves, of their households, and of their school programs and experiences all come into play in explaining the diversity of experiences of youth with disabilities.

### **Disability and Functioning**

**Disability characteristics.** NLTS2 analyses show that both the nature of a youth's primary disability and the functional limitations it imposes independently influence the outcomes he or she experiences. Yet different disabilities have quite different impacts across the outcome domains. For example, youth who are similar in other respects have the following kinds of differences in outcomes associated with the nature of their disability:

- Relative to youth with learning disabilities,<sup>1</sup> those with visual impairments experience more positive outcomes at school, in terms of lower absenteeism and higher reading and math abilities, but more negative independence outcomes, in terms of employment, apart from other differences between youth. Having a visual impairment does not have an independent impact on social involvement with groups or friends.
- Like youth with visual impairments, those with orthopedic impairments generally succeed at school, relative to those with learning disabilities, but they have less involvement with extracurricular groups and friends and less independence, in terms of assuming household responsibilities and holding a job.
- Youth with emotional disturbances also tend to do better in school than youth with learning disabilities, other factors held constant, and are equally likely to have active friendships, group memberships, and regular paid jobs. However, they are much more likely to experience negative consequences for behavior at school, in terms of disciplinary actions, and in the community, in terms of arrests.
- Youth with mental retardation have very similar outcomes to those with learning disabilities across most domains, independent of differences captured in the functional skills measures discussed below. An exception is that their cognitive disability shows up in their reading and mathematics skills, which are significantly farther behind grade level than those of students with learning disabilities. However, there are no significant differences in grades related to having mental retardation, independent of other differences in functioning between youth. This finding suggests that perhaps differences in grading standards between general education classes (frequented by students with learning disabilities) and special education classes (frequented by students with mental retardation) may not be adequately controlled for in these analyses.

In addition to the nature of youth's primary disabilities, NLTS2 investigated the independent relationship to outcomes of having attention deficit or attention deficit/hyperactivity disorder (ADD/ADHD). Apart from other differences between youth in their disability, functioning, or other characteristics, having ADD/ADHD as a primary or secondary disability is associated with several negative school-related outcomes, including poorer classroom engagement behaviors in special education settings, poorer grades, and more disciplinary actions. However, ADD/ADHD is not associated with lower academic abilities; youth whose parents report that they have that disorder are no more or less behind in reading or mathematics than youth who do not. In fact, having ADD/ADHD is positively associated with some social and independence outcomes: youth with ADD/ADHD are more likely than others to belong to extracurricular groups and hold regular paid jobs.

Two other characteristics of disability also were considered in NLTS2 multivariate analyses. The number of areas in which youth experience functional limitations and the age at which their disabilities first were diagnosed were considered proxies for the breadth or severity of youth's

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<sup>1</sup> Multivariate analyses require that for categorical variables, such as disability category, each category be compared with another specified category. Learning disability was chosen as the category against which to compare the relationships for other disabilities because it is the largest category and, therefore, most closely resembles the characteristics of students with disabilities as a whole.

disabilities and were expected to be related in similar ways with poorer outcomes. However, the two factors apparently capture different aspects of disability in that they relate differently, and not always negatively, to outcomes.

For example, dealing with the consequences of disability from an early age is related to better engagement behaviors in special education classes, better grades, and a lower likelihood of being subject to disciplinary actions. However, it also is related to a lower likelihood of seeing friends regularly and holding a paid job. Having functional limitations in more areas is associated with less absenteeism and a lower likelihood of arrest. However, it also is associated with being significantly more behind in reading, having less active friendships, and being less independent both at home and in the workforce. These differences underscore the complex relationships between disability and achievements.

**Functioning.** As was the case with indicators of the breadth or severity of disability, various measures of youth's functional abilities could be expected to relate in similar ways to outcomes, with higher skills being consistently associated with better outcomes. However, also as above, NLTS2 analyses show that different kinds of skills relate differently across the outcome domains in both intensity and direction of relationship. For example:

- Higher functional cognitive skills are strongly and positively related to higher academic achievement in both reading and math, as expected. They also relate to having more active friendships and greater independence in taking on household responsibilities and holding a job. Yet youth with higher functional cognitive skills also are more likely to get into trouble, both at school and in the community, independent of other differences between youth.
- One might think that disabilities that limit youth in managing basic self-care needs would have fairly pervasive and negative effects on outcomes, but NLTS2 analyses do not support that conclusion. Although poor self-care skills are associated with higher absenteeism and less active engagement in group activities, household responsibilities, and employment, they have no relationship to reading and math abilities, independent of other differences between youth. In fact, youth with lower self-care skills tend to have better grades than youth who are more fully functioning in managing their self-care needs, even controlling for differences in the percentage of classes taken in general education settings.
- Being socially more adept would clearly be expected to relate to better social adjustment outcomes, and it does. Youth with higher social-skills ratings by parents are significantly more likely to belong to groups, see friends regularly, and avoid disciplinary actions and arrests than youth with lower social skills, other factors held constant. Youth with higher social skills also are more active in taking on household responsibilities and in holding a regular paid job. At school, however, there is a more complex set of relationships. Although youth with higher social skills have higher grades and more positive classroom engagement behaviors in all settings than other youth, they also are significantly farther behind grade level in reading than their socially less skilled peers, reinforcing the notion that grades reflect more than academic ability.
- The ability to persist with tasks to completion has beneficial effects for youth in school. Those rated as more persistent by parents also exhibit more engagement in classroom

activities in all settings, receive better grades, and are more likely to take on household responsibilities than less persistent peers, other things being equal. This self-determination skill does not relate to academic abilities in reading and math, apart from other differences between youth.

- Youth's general health, an aspect of functioning, is included in analyses of absenteeism, and it demonstrates the strongest relationship to that indicator of engagement of any factor, underscoring the fact that absenteeism from school can be both voluntary and involuntary.

Taken together, these aspects of youth's disability and functioning explain much of the variance in the outcomes assessed, although more for some outcome domains (e.g., independence) than for others (e.g., academic performance). Yet characteristics of youth apart from their disabilities also contribute to an understanding of variations in their outcomes, as noted below.

### **Individual Demographic Characteristics**

Several of the demographic characteristics that typically are examined in studying adolescent outcomes in the general population, such as age, gender, or race/ethnicity, are intertwined with issues of disability (Marder, Levine, & Wagner, 2003). For example, youth with speech impairments tend to be younger and youth with emotional disturbances older than those in most other disability categories. Boys are much larger proportions of youth with other health impairments or autism than of those with sensory impairments. African Americans are disproportionately represented among youth with mental retardation or emotional disturbances than other categories. For these reasons, simple bivariate descriptions of outcomes for youth with disabilities who differ in age, gender, or race/ethnicity cannot be interpreted in a straightforward way. It is never clear whether it is age, gender, race/ethnicity, disability, or a combination of them that contributes to differences in outcomes observed. Multivariate analyses permit a disentangling of these factors, identifying their independent relationships with outcomes while holding constant disability and other factors in the analyses.

**Age.** Where in the 13- through 18-year-old<sup>2</sup> age range youth with disabilities are relates to some aspects of their outcomes, but in different ways and possibly for different reasons. The developmental nature of some outcomes is revealed in the fact that older youth are more likely than younger peers to take on household responsibilities and work outside the home, independent of other differences between them. This is a natural consequence of maturation and youth's taking on the beginnings of adult responsibilities. Analyses also reveal that older youth tend to be farther behind in their reading and math abilities, which may suggest that the skills of youth with disabilities do not develop at the same rate as those of youth in the general population, so that they fall farther behind with the passage of time.

However, another potential explanation for some of the relationship between age and academic performance is suggested by the relationship between age and disciplinary actions at school. Older youth are less likely to experience disciplinary actions than younger students with

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<sup>2</sup> Youth were ages 13 to 17 when Wave 1 parent interview data were collected and 14 through 18 when school surveys were conducted.

disabilities, other things being equal. Some of the explanation for this finding may have to do with the characteristics of youth with disabilities who leave high school early. Dropout rates are highest for youth with emotional disturbances, learning disabilities, mental retardation, or other health impairments, which are the categories of youth that are most likely to experience disciplinary actions at school. As they drop out, the group of students that is left includes fewer of these trouble-prone youth in each successive year. Thus, older youth are found less likely to be in trouble. A similar phenomenon may come into play regarding older youth's having poorer academic skills. Youth with emotional disturbances or other health impairments have high dropout rates and also tend to have higher reading and math abilities. Thus, older cohorts of youth do not include these high performers.

This explanation is further supported by the fact that age is related to a lower likelihood of having disciplinary problems at school but a higher likelihood of arrest in the community. Differential dropout rates for different disability categories would again have purged from the analysis of disciplinary actions all youth who had left school, including higher proportions of trouble-prone youth with emotional disturbances or other health impairments. However, these youth are not excluded from the analysis of arrests, which does not rely on information provided by the school. Thus, older youth who remain in school and are in the analyses of disciplinary actions tend to be less trouble-prone than younger students. In contrast, analyses of arrests, which involve both dropouts and students, show older youth to be more arrest-prone.

**Gender.** NLTS2 analyses demonstrate the clear challenge that being male poses for youth with disabilities, apart from differences between youth other than gender. Independent of other differences, boys with disabilities have poorer classroom engagement behaviors and lower grades than girls, both factors that reflect teachers' judgments. Boys with disabilities also are farther behind grade level in reading, although less likely to be behind in math than girls. And boys are much more likely to be subject to disciplinary actions at school and to arrest in the community. They are less involved with household chores at home, which may reflect or contribute to the fact that boys also are more likely than girls with disabilities to see friends regularly outside of school or organized group activities. Finally, the employment advantage once experienced by boys with disabilities relative to girls has disappeared (Wagner, Cameto, et al., 2003); high-school-age boys with disabilities are no more likely to hold regular paid jobs than their female counterparts, independent of other differences between them.

**Race/ethnicity.** Not only is race/ethnicity intertwined with disability in that youth of color are differentially represented across disability categories, it also is inextricably linked with household income. For example, the likelihood of living in poverty is almost three times as high for youth with disabilities who are African American or Hispanic than for those who are white (Marder, Levine, Wagner, et al., 2003). In addition, both youth with disabilities of color and those from lower-income households experience a tangle of other characteristics often associated with poor outcomes, such as single-parent families and low parent education. However, multivariate analyses that include both race/ethnicity and household income indicate that race/ethnicity is independently related to some youth outcomes, irrespective of disability, income, and other differences between youth. Compared with white youth with disabilities, both African-American and Hispanic youth are significantly farther behind grade level in both reading and math and are much less likely to have regular paid jobs. However, the outcome patterns of these two groups diverge in other areas. Relative to white youth with disabilities, African Americans demonstrate lower classroom engagement, receive lower grades, and are more likely

to be subject to disciplinary actions at school. In contrast, Hispanic youth with disabilities tend to get in trouble less at school and have classroom behaviors and grades that are not different from those of white youth. However, they do tend to be less likely to participate in organized group activities than white youth, independent of income and other differences between them. This different pattern of experiences of African-American and Hispanic youth with disabilities cautions against considering “minority youth” or “students of color” as a single group in assessing their outcomes.

**Primary language.** Independent of racial/ethnic differences among youth with disabilities, using a language other than English at home does not appear to relate to youth outcomes, with one important exception. Relative to those who primarily use English at home and irrespective of other differences between them, youth with disabilities who primarily use a language other than English at home are significantly farther behind grade level in reading—a skill that fundamentally involves language comprehension—than their peers. Continued or increasing lags in reading could be expected to manifest themselves in other aspects of academic performance over time.

### **Household Characteristics**

The household context in which youth with disabilities live can be expected to help shape their experiences across outcome domains. NLTS2 analyses include three aspects of youth’s household environments in analyses of outcomes: household income, levels of family support for education at home and at school, and parents’ expectations for the future of their adolescent children with disabilities.

**Household income.** Youth with disabilities are more likely than youth in the general population to live in low-income households (Marder, Levine, Wagner, et al., 2003). Further, NLTS2 analyses show a pattern of less positive outcomes for low-income youth, holding constant other factors. These findings may be a partial explanation for the difference in some outcomes between youth with disabilities and those in the general population, apart from differences related to disability. Regarding school engagement, youth with disabilities from lower-income households are more likely to be absent from school. Their academic performance also is poorer; they are farther behind grade level in reading and math and are more likely to receive poor grades. In the domain of social engagement, although they are more likely than wealthier peers to see friends regularly in informal get-togethers, youth from lower-income households are less likely to take part in organized group activities and are more subject to disciplinary actions at school and arrest in the community. Regarding emerging independence, lower-income youth are more likely than wealthier youth to be involved with household chores but do not differ from them in their likelihood of participating in the workforce. These relationships mirror some of those identified for nonwhite youth with disabilities, particularly those who are African American. Youth with disabilities who are both African American and from lower-income households experience the additive effects on outcomes noted here.

**Family support for education.** Families of youth with disabilities differ widely in the level of support they provide for the education of their children, both at home and at school, although there is some evidence that their support exceeds that of families of youth in the general population. For example, only 2% of parents of secondary school students in the general

population reported helping with homework five or more times a week (National Center for Education Statistics, 1998), compared with 20% of parents of youth with disabilities.

Youth with disabilities whose families are more involved in their schools, as demonstrated by such activities as attending school meetings or classroom events or volunteering at school, appear to benefit from that support in several ways. They are less far behind grade level in reading than youth with less family involvement at school. They also tend to have better grades and more active involvement in organized groups (many of which are at school) and with individual friendships. In the independence domain, they are more likely than youth from less involved families to have regular paid jobs. This pattern of relationships suggests that the kinds of active involvement families demonstrate in support of children at school may also be provided to youth in pursuing extracurricular activities, getting together with friends, and holding jobs. In contrast, family support for education at home (i.e., talking regularly about school and helping with homework, providing a computer for schoolwork) is not related to many outcomes, controlling for other differences among youth. One exception is that greater support for education at home is negatively associated with grades, possibly because parents are more likely to provide homework help to students who are doing poorly in school. Nevertheless, these findings reinforce the importance of parents' activities in support of their children in multiple domains.

**Family expectations for the future.** Expectations that parents hold for the future for their children with disabilities in part reflect parents' experience with and perceptions of the ways those disabilities limit activities and accomplishments. However, NLTS2 findings suggest that family expectations for the future also help shape the achievements of youth with disabilities, irrespective of the nature of youth's disabilities and their levels of functioning, particularly with regard to academic engagement and achievement.

Other things being equal, youth with disabilities whose parents expect that they are more likely to go on to postsecondary education after high school have more positive engagement and achievements while in high school than youth whose parents do not share that optimism for the future. Teachers report that these youth have more positive classroom engagement behaviors in all settings and give them better grades. Their academic achievement is in line with those better grades in that they are significantly closer to grade level in their tested reading and math abilities than youth who are not expected to further their educations after high school. Youth with disabilities whose parents hold high expectations for educational achievement also are more likely to avoid disciplinary actions and to affiliate with organized groups, many of which may be sponsored by or meet at school. Similarly, in the independence domain, youth with disabilities whose parents have high expectations that they will live independently without supervision in the future also are more likely to assume household responsibilities while in high school, independent of disability, functioning, or other differences among youth.

### **School Programs**

Although individual and household factors are strongly associated with outcomes for youth with disabilities, schools can make a difference for youth, particularly in the realm in which they are the most active partners: school engagement and academic performance. Course taking; services, accommodations, and supports; and other school-related experiences of youth all figure into their engagement and performance in their high school years. In fact, NLTS2 multivariate

analyses have been most successful in explaining variation in the most direct measure of student learning examined by NLTS2: the gap between tested and actual grade levels in reading and math. In those analyses, school programs and experiences account for virtually half of the explained variation. What schools do matters for students with disabilities.

**Enrollment in general education courses.** Overall, students with disabilities who take more of their classes in general education settings differ in many aspects of their disabilities from students whose course taking occurs mainly in special education settings. Therefore, to identify the impacts of general education course enrollment on outcomes, differences in disability and functioning between students in different settings must be held constant. NLTS2 multivariate analyses provide those statistical controls. Controlling for differences in the disability, functioning, demographic, and household factors discussed thus far, greater participation in general education classrooms relates independently to the engagement, achievement, and social adjustment of youth with disabilities at school. However, the directions of those relationships are decidedly mixed.

Students with disabilities who take a wider range of their courses in general education classes tend to miss fewer days of school and are closer to grade level in their reading and math abilities, irrespective of other differences between them and students who take fewer general education courses. They also are less subject to disciplinary actions than their peers whose course taking involves more special education classes. However, these positive findings must be balanced against indications that the general education classroom experience challenges the ability of many students with disabilities to succeed there, as reflected in the generally lower grades given by their teachers. Outside of class, however, students appear to accrue benefits in terms of a higher likelihood of engaging in extracurricular group activities at school or in the community and seeing friends regularly.

**Class size.** Youth with disabilities in larger classes tend to be closer to grade level in their reading and math abilities than students who are in smaller classes, irrespective of other differences in their school programs or disability, functioning, demographic, or household characteristics. This relationship may result from factors related to general and special education settings that are not adequately controlled in the model.

**Vocational education, services, and experiences.** The original NLTS found that vocational education, vocational services, and work experience all benefited students with disabilities as they transitioned out of high school into early adulthood (Wagner, et al., 1993). Although a variety of measures of vocational education, services, and experiences in high school were included in analyses of school engagement, academic performance, and independence (i.e., employment), positive relationships were not found in most cases. An exception is that taking vocational education is related to lower absenteeism among students with disabilities, other differences between them held constant. However, it is too early to conclude that vocational education, services, and activities do not benefit youth more widely. Analyses of subsequent waves of NLTS2 data are needed to determine whether the postschool benefits of high school vocational education that were identified in NLTS still hold true more than a decade later.

**Other services, accommodations, and supports.** Results of NLTS2 multivariate analyses illustrate the difficulty of identifying benefits that may accrue from services, accommodations, or supports while youth are receiving them. Students with disabilities are provided services (e.g., tutors or mental health services), accommodations (e.g., more time to take tests, use of a reader



or interpreter), or supports (e.g., a behavior management plan, books on tape) because they are deemed unable to perform up to their potential without them. Their limitations can be exhibited as negative outcomes, such as poor behavior or poor grades at school. Thus, when receipt of services or accommodations is measured at the same time as the outcomes that are the basis on which youth qualify for supports, a negative relationship between interventions and outcomes can occur. These negative relationships, in fact, are found in NLTS2 analyses of the relationships of a variety of academic and social supports. For example, receiving a greater number of instructional or testing modifications is related to poorer classroom engagement behaviors and being farther behind grade level in both reading and math. And receiving some kinds of social adjustment supports is related to a higher likelihood of being subject to disciplinary actions at school and/or arrest in the community.

However, not all services, accommodations, or supports are found to relate negatively to outcomes. Receiving help from a tutor is unrelated to grades or tested reading or math abilities, compared with students with disabilities who do not receive tutoring support. This finding suggests that tutors are helping students with disabilities keep up with peers who do not receive (and presumably do not need) tutoring. Similarly, receiving an array of communication or presentation accommodations is not associated with academic achievement. Thus, NLTS2 has had mixed success in overcoming the limits of analyses of intervention effectiveness that are conducted at a single point in time. Subsequent waves of NLTS2 data will permit the longitudinal analysis that is more appropriate to the question of intervention effectiveness.

### **School-Related Experiences**

NLTS2 analyses demonstrate that school experiences beyond courses, programs, and services are associated with students' outcomes both in and out of school.

**Absenteeism.** Missing school exacts a high price. When poor school engagement is reflected in high absenteeism from school, that absenteeism itself contributes to teachers' perceptions of poor classroom behaviors in all classroom settings. Students who miss a good deal of school also are farther behind in math and receive poorer grades than students whose attendance is better. High absenteeism and the associated poor grades and disciplinary actions all can contribute independently in powerful ways to dropping out of school by youth with disabilities (Wagner, 1991b).

**School mobility.** Frequent moving between schools is another contributor to a cluster of school outcomes that do not bode well for students' finishing high school. Other factors held constant, youth with disabilities who have changed schools often, other than for natural grade progression, exhibit higher absenteeism than students whose school affiliations have been more stable. Although NLTS2 analyses show no direct independent relationship between high school mobility and indicators of academic performance, mobility is associated with a lower likelihood of group membership and a higher likelihood of both disciplinary actions and criminal justice system involvement. Youth who have changed schools more frequently also are more likely to have a job in the community, consistent with a lower affiliation at school.

**Declassification from special education.** Analyses of the relationships between the declassification of students with disabilities from special education services and their academic performance indicate that only students' grades are significantly associated with that experience. This finding suggests that the factors that might be associated with the decision to declassify a

student—e.g., the nature of his or her disability, considerations of functioning, participation in general education classes—have been adequately controlled for in the multivariate analyses so that the declassification decision does not “proxy” for these kinds of differences between youth. Thus, there is little explanatory power left to be associated with declassification itself, so no significant relationship results.

**Grades and grade retention.** NLTS2 analyses contribute to the debate over the value of having poorly performing students repeat grades with findings that youth with disabilities who have been held back one or more grades in their school careers are less engaged in their classroom activities than other students; however, their absenteeism is not significantly higher, independent of other factors in the analyses. Controlling for other factors, students who receive lower grades also are in trouble more, both in school and with the criminal justice system. They also are less likely to experience the socializing effects of group memberships and more likely to see friends often outside of school or organized groups. As mentioned above, getting poor grades is part of a pattern of school experiences that contribute significantly to the choice by youth with disabilities to drop out of school.

### **Clusters of Factors That Make a Difference**

This summary of multivariate analyses related to the achievements of youth with disabilities suggests the independent effects of many aspects of youth, their households, and their school programs and experiences, holding constant other factors. However, in real life, many of the factors discussed here are not independent; they cluster together for many youth, resulting in additive effects that distinguish youth to a greater extent than is revealed by looking at factors independently. For example, we know that youth with emotional disturbances are more likely than youth in many other categories to be male, African American, and from lower-income households where they receive less family support for education than many other youth. They also are likely to have had their disabilities identified well into elementary school, have relatively poor social skills, spend much of their school day in general education classes, and receive a variety of social adjustment supports. In contrast, youth with visual impairments as a group comprise higher proportions of girls, students who are white, and those from higher-income households with high expectations for the future. Like students with emotional disturbances, they also spend a high percentage of their school day in general education classes, and they receive accommodations and supports appropriate to their disability.

NLTS2 findings suggest that students with these two profiles have dramatically different prognoses for the future. In the social adjustment domain, for example, the probability of being subject to disciplinary actions at school is 59 percentage points higher for a boy with an emotional disturbance than for a girl with a visual impairment. The likelihood of criminal justice system involvement is 42 percentage points higher for the boy with an emotional disturbance than for the girl with a visual impairment. Although the differences in other domains are less striking, they still are substantial. For example, given their different characteristics, the boy with an emotional disturbance is likely to miss 18 more days of school than the girl with a visual impairment, and thereby experience the poor academic outcomes that attend high absenteeism. Further, in the case of employment, there is a 12-percentage-point difference in the likelihood of these two hypothetical youth being employed in high school, favoring the boy with an emotional disturbance.

These findings reinforce the importance of considering the entirety of a youth's characteristics, background, and experiences in developing the relationships, instructional methods, services, and supports that will best help them succeed.

## **Supporting Positive Outcomes for Youth with Disabilities**

The NLTS2 analyses described in this report suggest a variety of opportunities for parents and schools to support youth with disabilities in achieving positive outcomes during secondary school. For parents, findings reinforce the value of holding high expectations for the future education and independence of youth, as well as for being actively involved at their children's school and in supporting their extracurricular activities. The importance of youth's persisting with their educational and other activities also is underscored; persistence is a trait that can be taught, both at home and at school (Mithaug, 1991). Social skills, too, have been demonstrated to be important to success in many domains, and they can be taught as well, in school (Agran, Blanchard, Wehmeyer, & Hughes, 2002) and in the community (David & Tierney, 1997) through adulthood (Bridges to Practice, 2003).

The mixed set of relationships associated with youth with disabilities taking many of their courses in general education classrooms invites schools to redouble efforts to support youth with disabilities and their teachers in those inclusive settings. Experiencing school with nondisabled peers is associated with a pattern of both learning and social benefits; yet grades earned by students with disabilities in general education classrooms tend to be lower. Poor grades can send a message of failure to youth that could militate against the benefits of inclusion and erode the commitment to school over time. If low enough, poor grades also mean students do not earn credits toward graduation for the courses they take, a powerful contributor to dropping out. Supporting students with disabilities in meeting the performance expectations embodied in general education grading standards remains a challenge to schools that are committed to giving students with disabilities full access to the general education curriculum.

NLTS2 analyses described in this report also have addressed the question of whether specific interventions, such as tutoring or social adjustment supports, are associated with more positive outcomes for students who receive them. Results of these analyses do not yield an unequivocal answer to that question or point clearly toward practices that are likely to improve results. As noted above, students often receive interventions or services because they have demonstrated performance problems in one or more domains. Thus, when services and performance are assessed simultaneously, as they are in analyses of the first wave of NLTS2 data, services can be associated with poorer outcomes relative to youth who did not receive services, presumably because they were not needed. The disappointment that may result because NLTS2 does not provide clearer guidance on "what works" in improving youth outcomes is expected to dissipate when multiple waves of information from NLTS2 permit a look at the impacts of interventions and services at one point in time on outcomes that occur later.

This report provides the most thorough examination to date of the achievements of youth with disabilities during their secondary school years across the multiple outcome domains of school engagement, academic performance, social adjustment, and independence. Analyses of factors associated with more positive outcomes highlight the myriad ways those factors can

combine to help shape the achievements of youth with disabilities and underscore the importance of maintaining individualization of school programs and services as the central tenet in the education of all students.

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## **Appendix A**

### **NLTS2 SAMPLING, DATA COLLECTION, AND ANALYSIS PROCEDURES**

This appendix describes several aspects of the NLTS2 methodology relevant to the Wave 1 data reported here, including:

- Sampling local education agencies (LEAs) and students
- Data sources and response rates
- Combining data from multiple sources
- Weighting the data
- Estimation and use of standard errors
- Unweighted and weighted sample sizes
- Calculating statistical significance
- Multivariate analysis methods
- Measurement and reporting issues.

#### **NLTS2 Sample Overview**

The NLTS2 sample was constructed in two stages. A stratified random sample of 3,634 LEAs was selected from the universe of approximately 12,000 LEAs that serve students receiving special education in at least one grade from 7th through 12th grades. These LEAs and 77 state-supported special schools that served primarily students with hearing and vision impairments and multiple disabilities were invited to participate in the study, with the intention of recruiting 497 LEAs and as many special schools as possible from which to select the target sample of about 12,000 students. The target LEA sample was reached; 501 LEAs and 38 special schools agreed to participate and provided rosters of students receiving special education in the designated age range, from which the student sample was selected.

The roster of all students in the NLTS2 age range who were receiving special education from each LEA<sup>1</sup> and special school was stratified by disability category. Students then were selected randomly from each disability category. Sampling fractions were calculated that would produce enough students in each category so that, in the final study year, findings will 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 11,276 students were selected and eligible to participate in NLTS2.

Details of the LEA and student samples are provided below.

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<sup>1</sup> 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 NLTS2 LEA Sample

### Defining the Universe of LEAs

The NLTS2 sample includes only LEAs that have teachers, students, administrators, and operating schools—that is, “operating LEAs.” It excludes such units as supervisory unions; Bureau of Indian Affairs schools; public and private agencies (e.g., 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, 1999) was used to construct the sampling frame because it had more recent information than the alternative list maintained by the National Center for Education Statistics. Correcting for errors and duplications resulted in a master list of 12,435 LEAs that met the selection criteria. These comprised the NLTS2 LEA sampling frame.

### Stratification

The NLTS2 LEA sample was 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 sample, to improve comparisons with the findings of other research, and to make NLTS2 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 variable selected was used by the Department of Commerce, the Bureau of Economic Analysis, and the National Assessment of Educational Progress (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 that 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 served by an LEA. The QED database provides enrollment data from which LEAs were sorted into four categories serving approximately equal numbers of students:

- **Very large** (estimated<sup>2</sup> enrollment greater than 14,931 in grades 7 through 12)
- **Large** (estimated enrollment from 4,661 to 14,930 in grades 7 through 12)
- **Medium** (estimated enrollment from 1,622 to 4,660 in grades 7 through 12)
- **Small** (estimated enrollment from 11 to 1,621 in grades 7 through 12).

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<sup>2</sup> 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 was multiplied by 6 to estimate the enrollment 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, each containing approximately 25% of the student population in grades 7 through 12:

- **High** (0% to 13% Orshansky)
- **Medium** (14% to 24% Orshansky)
- **Low** (25% to 43% Orshansky)
- **Very low** (more than 43% Orshansky).

The three variables generate a 64-cell grid into which the universe of LEAs was 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, 497 LEAs (and as many state-sponsored special schools as would participate) was considered sufficient to generate the student sample. Taking into account the rate at which LEAs were expected to refuse to participate, a sample of 3,635 LEAs was invited to participate, from which 497 participating LEAs might be recruited. A total of 501 LEAs actually provided students for the sample, 101% of the target number needed and 14% of those invited. Analyses of the region, size, and wealth of the LEA sample, both weighted and unweighted, confirmed that the weighted LEA sample closely resembled the LEA universe with respect to those variables.

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. Several analyses were conducted.

First, three variables from the QED database were chosen 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 underrepresenting African American students and college-bound students, and overrepresenting 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 that 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 NLTS2 Student Sample**

Determining the size of the NLTS2 student sample took into account the duration of the study, desired levels of precision, and assumptions regarding attrition and response rates. Analyses determined that approximately three students would need to be sampled for each student who would have a parent/youth interview in Wave 5 of NLTS2 data collection.

The NLTS2 sample design called for findings to be generalizable to students receiving special education as a whole and for the 12 special education disability categories currently in use and reported in this document. Standard errors were to be no more than 3.6%, except for the low-incidence categories of traumatic brain injury and deaf-blindness. Thus, by sampling 1,250 students per disability category (with the two exceptions noted) 402 students per category were expected to have a parent or youth interview in year 9. Assuming a 50% sampling efficiency (which is likely to be exceeded for most disability categories), 402 students would achieve a standard error of estimate of slightly less than 3.6%. All students with traumatic brain injury or with deaf-blindness in participating LEAs and special schools were selected. Students were disproportionately sampled by age to assure that there would be an adequate number of students who were age 24 or older at the conclusion of the study. Among the eligible students, 40.2% will be 24 or older as of the final interview.

LEAs and special schools were contacted to obtain their agreement to participate in the study and request rosters of students receiving special education who were ages 13 through 16 on December 1, 2000 and in at least 7th grade.<sup>3</sup> Requests for rosters specified that they contain the names and addresses of students receiving special education under the jurisdiction of the LEA, the disability category of each student, and the students' birthdates or ages. Some LEAs would provide only identification numbers for students, along with the corresponding birthdates 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 more than one child in a family was 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.

## **Data Sources**

Data reported here are drawn from a survey of parents of NLTS2 youth, conducted by telephone and mail, and mail surveys of staff in schools attended by NLTS2 sample members.

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<sup>3</sup> Students who were designated as being in ungraded programs also were sampled if they met the age criteria.

## **Parent Interview/Survey**

The NLTS2 conceptual framework suggests that a youth's nonschool experiences, such as extracurricular activities and friendships; historical information, such as age when disability was first identified; household characteristics, such as socioeconomic status; and a family's level and type of involvement in school-related areas are crucial to student outcomes. Parents/guardians are the most knowledgeable about these aspects of students' lives. They also are important sources of information on outcomes across domains. Thus, parents/guardians of NLTS2 sample members were interviewed by telephone or surveyed by mail in 2001, as part of Wave 1 data collection.

Matches of names, addresses, and telephone numbers of NLTS2 parents with existing national locator databases were conducted to maximize the completeness and accuracy of contact information and subsequent response rates. A student was required to have a working telephone number and an accurate address to be eligible for the parent interview sample.

Letters were sent to parents to notify them that their child had been selected for NLTS2 and that an interviewer would be attempting to contact them by telephone. The letter included a toll-free telephone number for parents to call to be interviewed if they did not have a telephone number where they could be reached reliably or if they wanted to make an appointment for the interview at a specific time.

Computer-assisted telephone interviewing (CATI) was used for parent interviews, which were conducted between mid-May and late September 2001. Ninety-five percent of interviews were conducted in English and 5% in Spanish.

All parents who could not be reached by telephone were mailed a self-administered questionnaire in a survey period that extended from September through December 2001. The questionnaire contained a subset of key items from the telephone interview. Exhibit A-1 reports the responses to the telephone and mail surveys.

Overall, 91% of respondents reported that they were parents of sample members (biological, adoptive, or step), and 1% were foster parents. Six percent were relatives other than parents, 2% were nonrelative legal guardians, and fewer than 1% reported other relationships to sample members.

**Exhibit A-1**  
**RESPONSE RATES FOR NLTS2**  
**PARENT/GUARDIAN TELEPHONE**  
**INTERVIEW AND MAIL SURVEY**

	Number	Percentage
Total eligible sample	11,276	100.0
Respondents		
Completed telephone interview	8,672	76.9
Partial telephone interview completed	300	2.7
Complete mail questionnaire	258	2.3
Total respondents	9230	81.9
Nonrespondents		
Refused	738	6.5
Language barrier	138	1.2
No response	1,170	10.4
Total nonrespondents	2,046	18.1

### School Data Collection

Data sources for the findings reported here also include (a) a mail survey of teachers of general education academic classes— if student took such a class, and (b) a mail survey of school staff who was most knowledgeable about student’s overall programs and school characteristics. The NLTS2 conceptual framework holds that classroom context, curriculum, instruction, accommodations, and assessment are crucial to student outcomes and are most amenable to intervention. Mail surveys collected information about aspects of the classroom experiences of students with disabilities in general education academic classes and in vocational education and special education settings. Further, students’ school experiences extend beyond the classroom, so that related services, IEP goals, participation in

district/state assessments all have a place in students’ experiences and can relate to student progress. These data are best provided by school staff who are most knowledgeable about the student’s classroom experiences and school programs.

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, the school enrollment form requested that schools provide the name of a school staff member (i.e., coordinator) who would be willing to oversee 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, general education academic teacher surveys were completed for 2,822 students, or 60% of eligible sample members, and 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 (with a response rate of 60%) or from publicly available databases.

## **Combining Data from Multiple Data Sources**

The multivariate analyses reported in Chapters 3 through 6 combine data from multiple sources (e.g., a dependent variable taken from the parent interview and independent variables from the school program survey). Although any single data source has a reasonably high response rate, a smaller number of youth have data from any particular combination of sources. When sample sizes decline markedly from using multiple data sources, statistical power is reduced and it is difficult for relationships to attain statistical significance even when they are quite large. Hence, it is important to maintain the analytic sample size to the maximum extent possible. It also is important to understand the students that are omitted from an analysis as the sample declines. NLTS2 approaches to these two issues are described in this section.

### **Maintaining the Analytic Sample Size**

Two approaches are used in NLTS2 to maintain the size of the sample used in analyses that combine data from multiple sources: constructing composite measures, and imputing missing values.

**Constructing composite measures.** Several variables in NLTS2 analyses can be measured using data from more than one source. For example, parents were asked to describe students' overall grades, and school staff were asked to report students' grades in specific general education academic and special education classes. In understanding the factors that are related to variation in students' grades, parents' reports were the preferred measure because they were considered the broadest indicator of students' overall grades. However, if a student was missing the grades item from the parent interview, the school-reported grade measure was used, with preference given to the setting (general or special education class) in which the student spent the largest part of his or her school day, as indicated on the school program survey. Thus, the grades variable includes students who have either a parent interview, a school program survey (on which grades are reported for a special education class) or a general education teacher survey, which results in a much larger number of youth included in analyses of grades than would result from including those with a single data source. The other variable constructed from a combination of parent and school data is the measure of whether students have been declassified from special education. In that case, preference was given to school-provided information, with parents' reports used if the school program survey item was missing.

Other examples of composite variables that use data from more than one instrument involve classroom characteristics and practices. As noted above, data were collected about both general education academic classes and special education classes if students had such classes, as well as about students' overall school programs. For students who have data on both kinds of classes, preference was given to information about the setting in which the given student took the most classes. Thus, the measure of class size combines information about general education classes for some students and special education classes for others. Measures involving receipt of particular interventions or services (i.e., tutoring, modifications or accommodations to instruction

or testing, presentation or communication modifications or accommodations, or social adjustment supports) gave preference to data provided about such programs or services in students' Individualized Education Plans (IEPs). If the school program survey was missing for a given student, but he or she had a general education teacher survey, information about accommodations or services provided in the class reported in that survey was used.

**Imputing missing values.** Missing values for particular variables occur either because an entire data source is missing for a given student (e.g., a student does not have a parent interview) or a respondent refused to answer or did not know the answer to a given item. Multivariate analyses exclude cases for which there is missing data for any variable included in them, resulting in the difficulties associated with reduced sample sizes already discussed.

Thus, it can be beneficial to impute values on key variables for youth who otherwise would be excluded from analyses because of missing data. Imputation procedures involve assigning a value for a youth with missing data that is the best prediction for that youth given what else is known about him or her. Although there are a variety of procedures for imputation, NLTS2 has employed a straightforward assignment of mean values that are calculated for a subset of youth who resemble the youth with missing values on specified dimensions that are relevant to the variable in question. For example, a student who is missing a value for an item that is included in the scale measuring family support for education at home was assigned the mean value on the missing item that was calculated for all other youth who share his or her disability category and whose head of household has the same level of education. These criteria for subsetting youth for purposes of imputation were selected because they relate significantly to variation in family involvement.

Although imputation can be a significant help in maintaining the analytic sample size, it also reduces the amount of variation in the variables chosen for imputation, thus reducing the strength of their relationships to other variables. Therefore, no dependent variables included imputed values. In selecting independent variables for imputation, careful judgment was used in weighing the trade offs between maintaining sample size and maintaining maximum variability and selecting only those that have a fairly limited number of missing values. Exhibit A-2 identifies the independent variables for which missing values were imputed, the criteria for imputation, and the number and percentage of cases across the multivariate analyses that had imputed values for each variable. For a given variable, the models with the smallest number of imputed values are those with a dependent variable that came from the same data source (i.e., missing data resulted from item nonresponse) whereas a larger number of values were imputed for models addressing variables from a different data source.



**Exhibit A-2**  
**IMPUTATION OF MISSING VALUES**

Variable Name	Criteria for Assigning Mean Values	Number (Percentage) of Cases with Assigned Values Across Multivariate Analyses
Self-care skills scale	Mean value of youth with same disability category and number of domains with functional limitation	1 to 3 (<.1%)
Functional cognitive skills scale	Mean value of youth with same disability category and number of domains with functional limitation	1 to 14 (<.1%)
Number of domains in which youth experiences functional limitations	Mean value of youth with same disability category	246 to 765 (14.8% to 19.3%)
Youth's persistence	Mean value of youth with same disability category	1 to 3 (<.1%)
Household income	Mean value of youth with same disability category, head of household education, and race/ethnicity	50 to 277 (3.0% to 3.7%)
Family involvement at home	Mean value of youth with same disability category and head of household education	16 to 520 (1.0% to 7.0%)
Family involvement at school	Mean value of youth with same disability category and head of household education	14 to 71 (.8% to 2.2%)
School mobility—number of school changes other than grade-level progression	Mean value of youth with same disability category, student age, and household income	246 to 765 (14.8% to 19.3%)
Absences excluding suspensions and expulsions (used as an independent variable only)	Mean value of youth with same disability category	117 to 531 (6.2% to 14.3%)

**Understanding the characteristics of youth included in analyses.** As mentioned above, combining data from multiple sources in a given analysis necessarily limits the youth included in it to those who have both data sources. It is important to understand the extent to which the included subset of youth is similar to or differs from the full sample in order to know whether the results of the analysis generalize to all youth or only to those represented in the subset. To address this question, NLTS2 compared means for all dependent and independent variables used in each multivariate model reported in this document with those of the full sample of youth for whom there are data. The number of cases included in each model and the results of the analyses of means are reported in Exhibit A-3.

**Exhibit A-3**  
**UNWEIGHTED MEANS OF VARIABLES INCLUDED IN THE FULL SAMPLE AND EACH**  
**MULTIVARIATE ANALYSIS**

	All Youth with Dis- abilities	Dependent Variable												
		Behavior in:				Grades	Reading Grade Dispre- pancy	Math Grade Discre- pancy	Belongs to Group	Sees Friends	Disci- plinary Action	Arrests	House- hold Respon- sibilities	Employ- ment
		Absent- eeism	General Ed. Class	Voca- tional Ed. Class	Special Ed. Class									
Sample size	10,443	3,196	1,668	2,265	2,156	3,186	2,004	1,872	3,909	3,834	3,647	3,935	7,405	3,304
Average:														
Days absent per month	2.1	2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Class behavior scale	11.3	NA	11.6	11.4	11.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Grade scale score	6.2	NA	NA	NA	NA	6.3	NA	NA	NA	NA	NA	NA	NA	NA
Reading grade discrepancy	-3.8	NA	NA	NA	NA	NA	-3.8	NA	NA	NA	NA	NA	NA	NA
Math grade discrepancy	-3.9	NA	NA	NA	NA	NA	NA	-4.0	NA	NA	NA	NA	NA	NA
Percentage:														
Belonging to groups	62.7	NA	NA	NA	NA	NA	NA	NA	67.7	NA	NA	NA	NA	NA
Seeing friends at least weekly	53.8	NA	NA	NA	NA	NA	NA	NA	NA	52.2	NA	NA	NA	NA
With disciplinary actions	25.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	29.1	NA	NA	NA
Ever arrested	8.3	NA	NA	NA	NA	NA	NA	NA	NA	NA		6.1	NA	NA
Average:														
Household responsibilities scale score	9.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.2	NA
Percentage:														
With paid job in past year	37.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	38.9
Speech impairment	9.4	8.0	13.8	6.8	7.0	8.9	6.6	6.7	8.5	8.6	8.3	8.5	9.0	8.1
Mental retardation	9.3	9.9	5.1	11.3	13.9	9.0	11.0	11.2	9.2	9.2	9.5	9.2	8.8	9.3
Emotional disturbance	8.9	5.6	7.1	4.9	7.0	6.4	8.3	8.4	5.8	5.8	6.0	5.8	9.1	5.9
Hearing impairment	9.1	10.2	9.2	12.2	6.0	10.8	13.2	12.7	10.9	10.7	10.4	10.9	9.7	11.3
Visual impairment	7.0	8.1	6.6	8.6	3.5	7.4	6.8	6.4	8.8	8.6	8.0	8.7	7.6	8.9
Orthopedic impairment	9.5	11.2	13.4	10.0	12.0	12.0	10.2	10.4	11.3	11.4	11.3	11.3	10.0	11.2
Other health impairment	10.0	11.2	16.7	10.4	12.4	12.6	12.3	12.3	11.3	11.4	11.6	11.2	10.6	11.0
Autism	9.7	10.8	6.2	10.2	11.4	8.8	8.3	8.4	9.9	9.8	10.1	10.0	9.8	9.4
Traumatic brain injury	3.8	4.3	4.5	4.2	4.9	4.5	4.4	4.8	4.2	4.3	4.3	4.3	4.4	4.4
Multiple disabilities/ deaf- blindness	11.3	10.9	4.4	11.8	11.0	8.2	8.5	8.3	10.5	10.3	10.5	10.6	11.3	10.6
ADD/ADHD	32.5	32.0	35.0	30.9	37.6	33.8	33.9	34.4	32.0	32.1	32.7	32.0	33.6	31.5
Average:														
Age at disability identification	3.8	3.6	4.5	3.4	3.8	3.8	3.8	3.8	3.6	3.6	3.6	3.6	3.8	3.6
Number domains with functional limitation	1.8	1.9	1.4	2.0	2.0	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.9
Self-care skills score	7.4	7.4	7.7	7.4	7.5	7.6	7.6	7.6	7.4	7.4	7.4	7.4	7.4	7.4
Functional cognitive skills score	12.6	12.5	14.1	12.4	12.4	13.1	13.0	13.0	12.6	12.6	12.6	12.6	12.6	12.6
Social skills score	20.0	20.1	20.7	20.2	19.9	20.3	20.2	20.2	20.2	20.2	20.2	20.2	20.0	20.2
Persistence score	2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Health score	3.9	4.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Age	15.8	15.9	15.7	15.9	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8

NA=Not applicable to the model.

**Exhibit A-3**  
**UNWEIGHTED MEANS OF VARIABLES INCLUDED IN THE FULL SAMPLE AND EACH**  
**MULTIVARIATE ANALYSIS**

		Dependent Variable													
		All Youth with Dis- abilities	Behavior in:				Reading Grade Dispre- pancy	Math Grade Discre- pancy					House- hold Respon- sibilities		Employ- ment
			Absent- eeism	General Ed. Class	Voca- tional Ed. Class	Special Ed. Class			Belongs to Group	Sees Friends	Disci- plinary Action	Arrests			
Percentage:															
Male	65.0	63.0	63.0	63.6	64.0	62.9	62.9	63.6	63.1	63.0	63.0	63.0	65.3	63.1	
African American	21.3	18.1	13.6	19.6	18.0	18.0	18.8	19.5	18.8	18.8	18.5	18.8	19.6	18.3	
Hispanic	12.9	10.3	9.1	10.6	10.1	10.0	11.1	10.8	10.3	10.2	10.1	10.2	12.8	9.9	
Other	3.6	3.1	2.9	3.0	3.2	3.0	2.7	3.0	2.9	2.9	3.0	2.9	3.2	3.0	
Primarily using language other than English at home	18.1	15.8	11.8	17.4	13.8	15.6	16.8	16.5	16.0	15.8	15.7	16.0	17.1	16.1	
Average															
Household income score	8.4	8.8	9.6	8.6	8.6	8.9	8.6	8.6	8.8	8.8	8.8	8.8	8.6	8.8	
Family involvement at home score	6.8	7.0	7.3	7.0	7.1	7.1	7.1	7.2	NA	NA	7.0	NA	6.9	NA	
Family involvement at school score	3.2	2.6	4.0	3.5	3.5	3.7	3.6	3.6	3.6	3.6	3.6	NA	NA	3.6	
Expectations for postsecondary education score	2.7	2.7	3.1	2.6	2.6	2.8	2.8	2.8	2.7	2.7	2.7	2.7	NA	NA	
Expectations for independent living score	2.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.9	NA	
Expectations for employment score	3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.6	
Percentage of classes taken in general education	49.0	48.2	78.8	42.3	43.2	53.9	49.1	48.5	48.7	49.3	49.2	NA	NA	NA	
Number social adjustment supports received	1.2	1.3	1.0	1.4	1.3	NA	NA	NA	1.2	1.2	1.2	1.2	NA	1.2	
Number test/instruction accommodations received	3.2	3.4	2.9	3.6	3.9	3.3	3.6	3.6	NA	NA	NA	NA	NA	NA	
Number presentation/communicatio n accommodations received	.9	1.0	.8	1.0	1.0	.9	1.0	1.0	NA	NA	NA	NA	NA	NA	
Number of school changes other than for grade progression	.9	.9	.8	.9	.9	.8	.8	.8	.8	.8	.8	.8	NA	.9	
Days absent other than suspensions/expulsions	2.2	NA	1.9	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	NA	NA	
Class size	13.9	13.2	17.5	12.3	11.0	14.0	13.2	13.3	NA	NA	13.4	NA	NA	NA	
Grade scale score	2.7	NA	NA	NA	NA	NA	NA	NA	2.8	2.8	2.8	2.8	NA	NA	
Number of vocational services	2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.0	
Percentage:															
Declassified	3.2	2.3	4.4	1.7	.6	2.5	1.8	1.9	NA	NA	2.5	NA	NA	NA	
Taking vocational education	72.7	76.1	62.5	NA	76.7	73.0	NA	NA	NA	NA	NA	NA	NA	73.6	
Retained at grade level	32.6	33.0	32.4	35.2	36.3	34.6	NA	NA	NA	33.2	NA	32.8	NA	29.4	
Receiving tutoring	40.5	NA	NA	NA	NA	38.0	39.5	39.2	NA	NA	NA	NA	NA	NA	
Having school-sponsored work experience	54.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	54.0	

NA=Not applicable to the model.

The subset of cases included in the majority of analyses depicted in Exhibit A-3 are not significantly different from the full sample of NLTS2 on any variable. However, four of the analyses purposefully selected specific subgroups of youth for the analyses that are expected to differ from the full sample. The analysis of grades includes only students who receive letter grades. However, in that model, too, the unweighted means do not differ significantly from the full sample on any variable. Greater differences are seen for the three models of classroom engagement behaviors, each of which included only students who took classes in that setting. Not surprisingly, the analysis of behaviors in general education academic classes have somewhat higher proportions of students from such categories as speech and orthopedic impairments, and the special education model includes somewhat larger proportions of students with mental retardation-. The general education model also includes youth with somewhat higher average functional abilities. However, even on these variables, differences are not large enough to attain statistical significance. As expected, the general education model differs most from the full sample in the percentage of classes students take in general education settings; as expected, the value on this variable is much higher for those included in the general education model than for the population as a whole. Class sizes also tend to be larger for students in general education classes. Other significant differences in the general education model are that it includes fewer students who are African American or that primarily use a language other than English than does the full NLTS2 sample.

## **Weighting Wave 1 Data**

The percentages and means reported in the data tables throughout this report are estimates of the true values for the population of youth with disabilities in the NLTS2 age range. The estimates are calculated from responses of parents of NLTS2 sample members and knowledgeable school staff. 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-4 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 proportion of students in the population that are from each disability category (actual NLTS2 weights account for disability category and several aspects of the districts from which they were chosen). The sample weights for this example appear in column C. Using these weights, the weighted population estimate is 87%. The percentages in all NLTS2 tables 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-4).

**Exhibit A-4**  
**EXAMPLE OF WEIGHTED PERCENTAGE CALCULATION**

Disability Category	A Number in Sample	B Participated in Group Activities	C Example Weight for Category	D 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
<b>TOTAL</b>	<b>10</b>	<b>6</b>	<b>10</b>	<b>8.7</b>
		Unweighted sample percentage = 60% (Column B total divided by Column A total)		Weighted population estimate = 87% (Column D total divided by Column C total)

The students in LEAs and state schools with data for each survey were weighted to represent the universe of students in LEAs and state schools using 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 the universe of LEAs in the cell served 400,000 students, then 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 (that is, each student in the sample of participating LEAs in that cell represented 100 students in the universe), there would be an estimated 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 (that is, the initial student sampling weights multiplied by the number of students with completed interviews) 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, there might not be any interviewees in some cells, 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 cells' weights could not vary from the average weight by more than a factor of 2, and (2) the average weight within each size strata 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 (Office of Special Education Programs, 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).

## **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 NLTS2 sample is 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) calculate the squares of the deviations of the half-sample estimate from the full sample estimate; and 3) adding the squared deviations and divide by (n-1) where n is the number of half-replicates.

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

$$N_{eff} = N \left( \frac{E^2[W]}{E^2[W] + V[W]} \right)$$

where  $N_{eff}$  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  $\sqrt{V[X]/N_{eff}}$ , where  $V[X]$  is the weighted variance of X.

NLTS2 respondents are not independent of each other because they are clustered in LEAs, and the intra-cluster correlation is not zero. However, the intra-cluster correlation traditionally has been quite small, so that 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” that assures that the standard error of estimate is 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 were calculated for each response category and the mean response to each question 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 was considered an adequate margin of safety. All standard errors in Wave 1 are 3.0% or less, except for categories of deaf-blindness, traumatic

brain injury, and visual impairments, where sample sizes are small. For these disability categories, the standard errors were at most 4.9%, 4.9%, and 3.5% for dichotomous variables.

## Unweighted and Weighted Sample Sizes

As indicated above, standard errors accompany all estimates reported in the descriptive 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 descriptive 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 22% of youth are employed at a given time, how many youth in the country are employed?). 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-5. NLTS2 findings indicate that 25.1% of youth with learning disabilities are currently employed (see Exhibit 6-15). The standard error accompanying that estimate is 2.1, indicating that the true current employment rate for the population is likely to fall between 23% and 27.2%. There are 1,130,539 youth with learning disabilities in the NLTS2 age range. Multiplying the percentages by this population size yields a single-point estimate of 283,765 and a range of 260,024 to 307,507, within which the actual population size will fall, with 95% confidence.

**Exhibit A-5**  
**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)
25.1	2.1	23.0 to 27.2	1,130,539	283,765	260,024 to 307,507

Because percentage estimates are provided not only for the full sample of youth with disabilities, but also for youth who differ in primary disability category, 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-6.



**Exhibit A-6**  
**POPULATION SIZES OF GROUPS REPRESENTED BY NLTS2**

Groups	Number
All youth with disabilities	1,838,848
Disability category:	
Learning disability	1,130,539
Speech/language impairment	76,590
Mental retardation	213,552
Emotional disturbance	203,937
Hearing impairment	22,001
Visual impairment	8,013
Orthopedic impairment	21,006
Other health impairment	98,197
Autism	14,637
Traumatic brain injury	6,379
Multiple disabilities	34,865
Deaf-blindness	340

### 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:

$$\frac{(P_1 - P_2)^2}{SE_1^2 + SE_2^2} > 1.96^2$$

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 the 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.

### Multivariate Analysis Methods

Multivariate techniques are used in this report to assess the independent relationships

between outcome measures and characteristics of individual youth, their households, and their school program and experiences.

Multiple linear regression analysis is used to examine the variation in ordinal dependent variables (i.e., days absent, classroom engagement behavior scale scores, grades, discrepancies in reading and math levels, and household responsibilities scale scores). Multiple linear regression equations involve a linear combination of a set of independent variables in the following algebraic form:  $Y' = a + b_1X_1 + b_2X_2 + \dots + b_nX_n$ , where  $Y'$  is the predicted value of the dependent variable,  $a$  is the constant or  $Y$  intercept,  $b$ s are the partial regression coefficients, and  $X$ 's are the values of the independent variables. When the dependent variables are dichotomous (i.e., whether youth belong to groups, see friends at least weekly, have been subject to disciplinary actions, have been involved with the criminal justice system, or hold a job), logistic regression is used [e.g.,  $\log(\text{probability of criminal justice system involvement/no involvement}) = a + b_1X_1 + b_2X_2 + \dots + b_nX_n$ ]. Both types of regression allow the modeling of the simultaneous influence of predictor variables on the dependent variable and provide estimates of model fit. For ease of interpretation, coefficients of logistic regression analyses are transformed into differences in the probabilities of the dependent variable occurring given a specified increment of difference in the independent variables.

NLTS2 multivariate analyses and correlations are unweighted. In general, results are reported for analyses that include the full set of individual, household, and school factors simultaneously. The one exception is that the analyses of the relationships between individual social adjustment interventions or supports and outcomes that are reported in Chapter 5, Exhibit 5-10 entered each of several interventions separately into models that also included all other individual, household, or school factors. This strategy was employed because of high intercorrelations among interventions. Coefficients for the individual, household, and other school factors in those analyses result from models that did not include the individual interventions.

## Measurement and Reporting Issues

The chapters in this report provide information on specific variables included in analyses. However, several general points about NLTS2 measures that are used repeatedly in analyses 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 NLTS2 age range receiving special education services in the 2000-01 school year under the auspices of participating LEAs and state-supported special schools. In data tables included in this report, students are 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 in making category assignments (Exhibit A-7), criteria and methods for assigning students to categories vary from state-to-state and even between districts within states. Thus, there is the potential for substantial variation in the nature and severity of disabilities included in categories (see for example, MacMillan & Siperstein, 2002) and NLTS2 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

## **Exhibit A-7**

### **DEFINITIONS OF DISABILITIES<sup>4</sup>**

**Autism:** A developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age 3, that adversely affects a child's educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences. The term does not apply if a child's educational performance is adversely affected primarily because the child has a serious emotional disturbance as defined below.

**Deafness:** A hearing impairment so severe that the child cannot understand what is being said even with a hearing aid.

**Deaf-Blindness:** A combination of hearing and visual impairments causing such severe communication, developmental, and educational problems that the child cannot be accommodated in either a program specifically for the deaf or a program specifically for the blind.

**Emotional Disturbance:**<sup>5</sup> A condition exhibiting one or more of the following characteristics, displayed over a long period of time and to a marked degree that adversely affects a child's educational performance:

- An inability to learn that cannot be explained by intellectual, sensory, or health factors
- An inability to build or maintain satisfactory interpersonal relationships with peers or teachers
- Inappropriate types of behavior or feelings under normal circumstances
- A general pervasive mood of unhappiness or depression
- A tendency to develop physical symptoms or fears associated with personal or school problems.

This term includes schizophrenia, but does not include students who are socially maladjusted, unless they have a serious emotional disturbance.

**Hearing impairment:** An impairment in hearing, whether permanent or fluctuating, that adversely affects a child's educational performance but that is not included under the definition of deafness as listed above.

**Mental retardation:** Significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period that adversely affects a child's educational performance.

**Multiple disabilities:** A combination of impairments (such as mental retardation-blindness, or mental retardation-physical disabilities) that causes such severe educational problems that the child cannot be accommodated in a special education program solely for one of the impairments. The term does not include deaf-blindness.

**Orthopedic impairment:** A severe orthopedic impairment that adversely affects educational performance. The term includes impairments such as amputation, absence of a limb, cerebral palsy, poliomyelitis, and bone tuberculosis.

**Other health impairment:** Having limited strength, vitality, or alertness due to chronic or acute health problems such as a heart condition, rheumatic fever, asthma, hemophilia, and leukemia, which adversely affect educational performance.<sup>6</sup>

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<sup>4</sup> From ERIC Digests (1998).

<sup>5</sup> P.L. 105-17, the Individuals with Disabilities Education Act Amendments of 1997, changed "serious emotional disturbance" to "emotional disturbance." The change has no substantive or legal significance. It is intended strictly to eliminate any negative connotation of the term "serious."

<sup>6</sup> OSEP guidelines indicate that "children with ADD, where ADD is a chronic or acute health problem resulting in limited alertness, may be considered disabled under Part B solely on the basis of this disorder under the 'other health

**Exhibit A-7**  
**DEFINITIONS OF DISABILITIES (Continued)**

**Specific Learning Disability:** A disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. This term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. This term does not include children who have learning problems that are primarily the result of visual, hearing, or motor disabilities; mental retardation; or environmental, cultural or economic disadvantage.

**Speech or language impairment:** A communication disorder such as stuttering, impaired articulation, language impairment, or a voice impairment that adversely affects a child's educational performance.

**Traumatic brain injury:** An acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance. The term applies to open or closed head injuries resulting in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem-solving; sensory, perceptual and motor abilities; psychosocial behavior; physical functions; information processing; and speech. The term does not apply to brain injuries that are congenital or degenerative, or brain injuries induced by birth trauma. As with autism, traumatic brain injury (TBI) was added as a separate category of disability in 1990 under P.L. 101-476.

**Visual impairment, including blindness:** An impairment in vision that, even with correction, adversely affects a child's educational performance. The term includes both partial sight and blindness.

school or district. Therefore, it is appropriate to conclude that these descriptive data are nationally generalizable to youth in the NLTS2 age range who were classified as having a particular primary disability in the 2000-01 school year.

The exception to reliance on school or district category assignment involves students with deaf-blindness. District variation in assigning students with both hearing and visual impairments to the category of deaf-blindness results in many students with those dual disabilities being assigned to other primary disability categories, most often hearing impairment, visual impairment, and multiple disabilities. Because of these classification differences, national estimates suggest that there were 3,196 students with deaf-blindness who were ages 12 to 17 in 1999 (National Technical Assistance Center, 1999), whereas the federal child count indicated that 681 were classified with deaf-blindness as their primary disability (Office of Special Education Programs, 2001).

To describe the characteristics and experiences of the larger body of youth with deaf-blindness more accurately and precisely, students who were reported by parents or by schools or school districts<sup>7</sup> as having both a hearing and a visual impairment were assigned to the deaf-blindness category for purposes of NLTS2 reporting, regardless of the primary disability category assigned by the school or school district. This increased the number of youth with deaf-

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impaired' category in situations where special education and related services are needed because of the ADD" (Davila, 1991).

<sup>7</sup> Some special schools and school districts reported secondary disabilities for students. So, for example, a student with visual impairment as his or her primary disability category also could have been reported as having a hearing impairment as a secondary disability.

blindness for whom parent data were collected from 24 who were categorized by their school or district as having deaf-blindness as a primary disability to 166. The number of students reassigned to the deaf-blindness category and their original designation of primary disability are indicated in Exhibit A-8. *Because there still are relatively few members of the deaf-blindness disability category, for purposes of multivariate analyses, they are included with the category of multiple disabilities.*

<b>Exhibit A-8</b> <b>ORIGINAL PRIMARY DISABILITY</b> <b>CATEGORY OF YOUTH ASSIGNED TO</b> <b>DEAF-BLINDNESS CATEGORY FOR</b> <b>NLTS2 REPORTING PURPOSES</b>	
<b>Original Primary Disability Category</b>	<b>Number</b>
Deaf-blindness	24
Visual impairment	46
Hearing impairment	43
Multiple disabilities	31
Orthopedic impairment	7
Mental retardation	6
Traumatic brain injury	4
Other health impairment	3
Speech/language impairment	1
Autism	1
Total	166

**Measuring course grades.** Teacher grades are a key dependent variable for the academic performance outcome domain discussed in Chapter 4 and is an independent variable used in analyses of some other outcomes. As a dependent variable, grade information is taken from the parent interview. Respondents were asked to report students' overall grades on a 9-point scale (e.g., mostly As, mostly As and Bs, mostly Bs, etc.). For youth with no parent interview, teachers of general or special education classes were asked to report students' grades in their classes on the same 9-point scale. Data were used for the setting in which students take the most classes. Only students who receive this kind of letter grade are included in the analysis of this outcome measure.

If students do not receive traditional letter grades, parents and teachers were given an option of reporting qualitative indicators of student performance (e.g., excellent, good, fair, poor, or passing/not passing). When grades are used as an independent variable, it was considered important to include all students, including both those who receive letter grades and those who receive grades that are measured on a qualitative scale. Thus, the letter grade metric and various qualitative metrics needed to be combined. To do so, a 4-category variable was created. Letter grades from the 9-point scale were collapsed as indicated in the first column of Exhibit A-9. The corresponding qualitative grades appear in the second column.

**Exhibit A-9  
CORRESPONDENCE OF LETTER AND  
QUALITATIVE GRADES IN  
CONSTRUCTING A COMPOSITE GRADE  
VARIABLE**

Letter Grades	Qualitative Grades
Mostly As/Mostly As and Bs	Excellent
Mostly Bs/Mostly Bs and Cs	Good
Mostly Cs/Mostly Cs and Ds	Fair
Mostly Ds/Mostly Ds and Fs/Mostly Fs	Poor/Unsatisfactory/ Failing

Note that grades reported as “needs improvement”, “satisfactory,” or “passing” were not included in the analyses because their correspondence to a letter grade category was not clear.

**Measuring mobility for students with visual impairments.** This outcome is presented as part of the discussion of independence in Chapter 6. The student’s school program survey included a series of 10 items to be completed by respondents for all youth with a visual impairment as either their primary or a secondary disability. With advice from experts in the mobility of those with visual impairments, items

were selected from the teacher checklist for orientation and mobility used at the Texas School for the Blind and Visually Impaired. Respondents indicated whether youth could do the following “very well,” “pretty well,” or “not very well”:

- Travel using sighted guide to familiar locations
- Travel indoors using rotely learned routes
- Travel to other areas using rotely learned routes
- Create new routes between familiar places indoors
- Execute route within building w/verbal directions
- Execute route in another building w/directions
- Locate unfamiliar place by numbering systems
- Orient oneself to unfamiliar room
- Solicit help to orient oneself to a building
- Solicit help to orient oneself to the school campus or a workplace.

A scale was created by summing values on these items, which ranges from 10 (all tasks done “not at all well”) to 30 (all tasks done “very well”).

**Assessing vocational services.** The student’s school program survey includes a list of 12 items on vocational services or programs, which were to be completed by respondents for all high school students. Respondents were asked to indicate whether a youth had received any of the services since starting high school and, if so, which ones. The programs and services include the following (the percentage of students with disabilities receiving each is indicated in parentheses):

- A formal assessment of career skills or interests (51%)
- Career counseling (44%)
- Job readiness or prevocational training (36%)
- Instruction in looking for jobs (36%)

- Job shadowing, work exploration (19%)
- Internship, apprenticeship (2%)
- Tech-prep program (12%)
- Entrepreneurship program (1%)
- Other work experience (paid or unpaid) (19%)
- Specific job skills training (14%)
- Referrals to potential employers or other job placement support (10%)
- Job coach, e.g., staff who work with employer to modify job for this student, or monitor student performance on the job (8%).

The vocational services variable used in analyses in Chapter 6 is a scale created by summing the number of these services that each student received.

**Comparisons with the general population of students.** In cases in which databases for the general population of youth are publicly available (e.g., the National Household Education Survey), comparisons have been calculated from those databases for youth who match in age to those included in NLTS2. However, some comparisons have been made using published data. For some of these comparisons, differences in samples (e.g., ages of students) or measurement (e.g., question wording on surveys) reduce the direct comparability of NLTS2 and general population data. Where these limitations affect the comparisons, they are pointed out in the text and the implications for the comparisons are noted.

**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 number.

## APPENDIX A REFERENCES

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## Appendix B

### RESULTS OF MULTIVARIATE ANALYSES OF RELATIONSHIPS OF SCHOOL CONTEXT FACTORS TO OUTCOMES OF STUDENTS WITH DISABILITIES

The NLTS2 conceptual framework reflects an understanding of the potential the school environment has in shaping the outcomes of students. To assess the degree to which characteristics of the schools attended by secondary-school-age youth with disabilities relate to the outcomes they achieve, the following school characteristics were investigated in relationship to the outcomes identified in Chapter 1.

**Type of school.** Students attend a number of different types of public or private instructional settings, including regular comprehensive high schools; special schools for students with disabilities; an array of “schools of choice,” including magnet, charter, vocational, and alternative schools; and home-schooling. These settings provide a broad array of teachers and teaching approaches, peers, course options, policies, and other factors that could significantly affect students’ outcomes. The large majority (93%) of secondary-school-age youth who attend school do so at regular comprehensive secondary schools that serve a full range of students. Few students (3%) attend special schools only for students with disabilities, magnet schools (1%), alternative schools (1%), charter schools (.2%), or other settings for schooling (2%). NLTS2 analyses included a dichotomous variable indicating whether students attended a regular comprehensive school that serves a wide variety of students or another kind of school.

**School size.** The influence of school size on the quality of education has evoked passionate arguments about the appropriate size of schools. For many years, proponents of larger schools have argued that they are more efficient, cost-effective, and able to offer a more adequate and varied curriculum than smaller schools (Conant, 1959; Smith & DeYoung, 1988; Cotton, 1996), all of which are expected to result in positive student outcomes. Yet supporters of small schools report data linking decreased school size to improved 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, Monk, & Tien, 1993). NLTS2 explores the implications of school size for students with disabilities by including the enrollment of the schools that students attend in analyses of their outcomes across domains. Students with disabilities in the NLTS2 age range attend schools with 1,310 students, on average, although 19% attend schools with 600 or fewer students and 23% attend schools with more than 1,800 students. These schools are substantially larger than those attended by youth in the general population (an average of 751 students in high schools; National Center for Education Statistics, 2002).

**Student body demographic characteristics.** Not just the size of the student body of a school but its characteristics also can shape the experiences of students in important ways. The racial/ethnic distribution and income level within a school are key aspects of the student body profile, with high-minority and high-poverty schools generally experiencing poorer student outcomes (Blank, Manise, & Braithwaite, 2000; Banks, 2001). A variable measuring the percentage of students who are eligible for free or reduced-price lunches, a proxy measure for

students in poverty, was used in analyses to explore relationships to outcomes. Because it is highly correlated with the percentage of nonwhite students in the school, only the measure of poverty was included in the analyses.

**Student mobility.** Research has demonstrated relationships between high rates of student mobility and poor school performance and frequent behavioral problems (Demie, 2002; Wood, Halfon, Scarlata, Newacheck, & Nessim, 1993; Rumberger, 2002). A study of a nationally representative sample of almost 10,000 school-age students found that frequent moves were associated with increased risk of school failure and behavioral disorders, independent of characteristics such as poverty, race, and family structure (Simpson & Fowler, 1994). Research also shows other negative academic consequences for frequent school changes, including below-grade-level reading scores, grade retention, and poor health (Rumberger, 2002). Having a high rate of mobility in a student population is expected to result in a learning environment with a high incidence of these issues and less stable relationships among students and between students and staff. The average mobility rate in schools attended by secondary school students with disabilities is 11%, although 39% of students go to schools with a mobility rate of 5% or less, and 13% attend schools where the rate is more than 20%.

**Richness of programmatic resources.** The number of support programs available in a school indicates the range of options open to staff and students in meeting the diversity of learning needs and extracurricular interests within the student body. Analyses include a tally of the following programs or services available in schools attended by students with disabilities:

- Academic supports (e.g., homework club, tutoring or mentoring outside of class)
- Diagnostic and prescriptive services to identify learning problems or needs
- Programs for gifted and talented students
- Summer school
- College and career awareness and preparation activities
- Supplemental instruction in reading/language arts
- Supplemental instruction in math
- Enrichment or recreational clubs or activities outside of class
- Weekend programs for students
- Performing groups (e.g., band, drama, chorus)
- Organized school sports activities
- School-based health clinics
- Counseling or pupil services
- Reproductive health/pregnancy prevention education
- Dropout prevention programs or services
- Substance abuse education
- Substance abuse treatment

- Teen parenting programs
- Child care for children of parenting teens
- Conflict resolution/conflict management programs
- Services for out-of-school youth (e.g., GED program)
- School-to-work activities or employment services
- Title I, bilingual or ESL classes
- Class size reduction initiative
- Schoolwide reform project (e.g., Accelerated Schools)
- Obey-Porter grant to support a schoolwide reform model

The summary scale of such programs and services ranges from 1 to 26, with a mean of 15.

**Student-teacher ratio.** Many schools have undertaken efforts to reduce the size of classes (and, therefore, the ratio of students to teachers) with the conviction that a reduced student-teacher ratio provides opportunities to better meet the diversity of learning needs in a class. Smaller schools or lower student-teacher ratios may be particularly important for students with disabilities if they create an environment that promotes students' engagement and inclusion or allow teachers to tailor instruction more effectively to the needs of individual students with disabilities. Students with disabilities attend schools where the average student-teacher ratio is 23 to 1.

**Level of academic pressure.** Recent reforms in public education have increased the accountability of schools for improving the academic performance of all students, including those with disabilities. This emphasis can be reflected at the school level in instructional practices, policies toward testing, and teacher supports. Ultimately, increased emphasis on academic improvement is expected to result in better performance at the student level. To explore this relationship, NLTS2 analyses included responses from the school characteristics survey to the question "In your opinion, how much pressure is placed on your school to increase and/or improve student test scores for all students?" Responses included "a great deal of pressure," "a fair amount of pressure," "a little pressure," and "no pressure at all." More than half of students with disabilities go to schools where there is reported to be "a great deal of pressure" to improve test scores; 8% attend schools with "little" or "no pressure at all."

**Social promotion policy.** In the long-standing debate on social promotion, two primary views are articulated. One position holds that promotion to the next grade level implies that a student has mastered the academic skills and content of the prior grade and is prepared for the increased demands in the next grade level; students who have not achieved that mastery should repeat the grade so that they have the opportunity to learn the skills necessary as a foundation for future success. An alternative perspective holds that, although mastery of academic skills is important, social development is part of the educational process. When students are retained a grade, they are separated from their age peers and may suffer a loss in motivation and self-esteem, which, in turn, may erode a student's ability to succeed in school. Much of the research on the subject for more than a decade provides some support for the latter position (Thompson, 1999; Holmes, 1989). Although during the 1970s and 1980s, social promotion was viewed favorably by many and was commonly practiced, "The pendulum today is clearly swinging

toward not allowing for any conditional promotion and mandating retention for all low-performing students...” (Smink, 2001). NLTS2 findings show that, overall, half of students with disabilities attend schools that prohibit the promotion of special education students who are performing poorly, a rate that is somewhat lower than the rate at which schools are reported to prohibit social promotion for general education students (58%,  $p < .05$ ).

**School climate.** One perspective on the climate in schools attended by students with disabilities was gained by asking respondents to the student’s school program survey to report their level of agreement with three statements about their school:

- The school leadership has high expectations and standards for students and teachers.
- The principal promotes instructional improvement among school staff.
- This school is a safe place for students.

Responses on a 3-point scale included “strongly agree,” “agree,” and “disagree or strongly disagree.” Responses were summed to create an overall scale that ranges from 3 to 9, with a mean of 7.

The factors described above were included in multivariate analyses of the full range of outcomes discussed in Chapter 1. They were included in separate analyses, rather than as factors added to the more comprehensive analyses described in this report, for several reasons. First, the characteristics of schools attended by youth with disabilities do not vary systematically for students in different disability categories or with different levels of functioning, so these differences among students did not need to be controlled for in analyses, apart from specifying whether the schools attended are regular comprehensive schools or special schools of some kind. Also, although school characteristics do vary for students who differ in income level and racial/ethnic background, for example, these differences are accounted for in the school context analyses by using similar factors measured at the school level (e.g., racial/ethnic distribution of the student body, percentage eligible for free or reduced-price lunch). Finally, the school context factors hypothesized to relate to students’ outcomes were measured through the NLTS2 school characteristics survey. This instrument had the lowest response rate of the school surveys (60%). Therefore, including variables from it in the more comprehensive analyses seriously reduced the number of cases in the analyses and jeopardized their applicability to students with disabilities as a whole.

Results of the multivariate analyses exploring relationships between the factors above and the various outcomes of youth with disabilities did not explain a significant portion of the variation in those outcomes. The explained variation in no case exceeded 2%. Although several individual factors were significantly related to some outcomes, there was no consistent pattern of relationship. Thus, the findings are not included in this report.

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## **Appendix C**

### **DEMOGRAPHIC CHARACTERISTICS OF YOUTH WITH DISABILITIES AND THEIR HOUSEHOLDS**

Understanding the characteristics of youth with disabilities is a crucial foundation for serving them well. Youth bring to their educational experiences a complex history and background that is shaped by demographic characteristics, such as age, gender, and ethnicity; by family background and circumstances, such as parents' education and household income; and by the nature of the students' disabilities. These factors help structure the involvement of youth at home, at school, and in the community, as well as the ways in which they, their parents, school staff, and other service personnel work together toward positive results for youth. Thus, individual and household characteristics are essential elements of the context for many major life experiences of youth and understanding that context will inform how these experiences are interpreted.

A brief summary of selected individual characteristics and household risk factors of youth with disabilities is presented below.<sup>1</sup>

#### **Individual Characteristics**

For youth, age is a major determinant of development that influences their competence and independence. Yet, there is quite a bit of variation in maturation among teens, resulting in sizable differences in abilities and activities between youth of the same age. Gender is a defining human characteristic, and during adolescence, when young people are exploring their sexuality and gender roles, it can shape their experiences and choices in powerful ways. In addition, racial/ethnic and language background can be associated with rich cultural traditions, patterns of relationships within families and communities, and strong group identification, which can generate important differences in values, perspectives, expectations, and practices.

The importance of understanding the demographic makeup of the population of youth with disabilities is crucial in interpreting NLTS2 findings for the group as a whole and for youth with particular disability classifications. It also is a foundation for interpreting comparisons between youth with disabilities and those in the general population.

Below, the primary disability classifications among youth with disabilities are reported, and other traits that are important to their experiences are described. These are presented for youth with disabilities as a whole, compared with the general population when possible, and then described as they vary for youth with different primary disability classifications.

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<sup>1</sup> A more detailed discussion of these characteristics can be found in Levine, Wagner, & Marder (2003) and Levine, Marder, Wagner, & Cardoso (2003).

## Primary Disabilities of Youth

In the 2000-01 school year, students who received special education constituted 13% of all 13- to 16-year-olds who were enrolled in school.<sup>2</sup> Exhibit C-1 depicts the primary disability classifications assigned by schools to those students (Office of Special Education Programs, 2002). Overall, 62% of students receiving special education in this age group were classified as having a learning disability. Youth with mental retardation and emotional disturbances comprised 12% and 11% of students, respectively. Another 5% of youth were classified as having other health impairments, and 4% were identified as having speech impairments. The seven remaining disability categories each comprised 1% or less of the total child count or, taken together, about 5% of youth with disabilities. Thus, when findings are presented for youth with disabilities in this age group as a whole, they represent largely the experiences of those with learning disabilities.

<b>Exhibit C-1</b> <b>DISABILITY CATEGORY DISTRIBUTION OF YOUTH WITH</b> <b>DISABILITIES, AGES 13 TO 16</b>			
Primary Disability Classification	Federal Child Count <sup>3</sup>		NLTS2 Weighted
	Number	Percentage	Percentage
Specific learning disability	1,130,539	61.8	62.0
Speech/language impairment	76,590	4.2	4.0
Mental retardation	213,552	11.7	12.2
Emotional disturbance	203,937	11.2	11.4
Hearing impairment	22,001	1.2	1.3
Visual impairment	8,013	.4	.5
Orthopedic impairment	21,006	1.2	1.2
Other health impairment	98,197	5.4	4.6
Autism	14,637	.8	.7
Traumatic brain injury	6,379	.2	.3
Multiple disabilities	34,865	1.2	1.8
Deaf-blindness	340	<.1	.2
TOTAL	1,838,848	100.0	100.0

It is important to note that, although students receiving special education often are referred to as “students with disabilities,” the population of those with disabilities is larger than those receiving special education. For example, parents of 6% of the general population of children under age 18 report that their children have a visual impairment, 13% have a hearing impairment, and almost 16% report that their children have a speech impairment (National Center for Health Statistics, 2001). Yet, the number of students who receive special education services primarily for those

impairments combined constitute fewer than 3% of all students under age 18 (Office of Special Education Programs, 2002). This difference points up the fact that many children and youth experience some degree of disability that does not require specially designed instruction.

Exhibit C-1 demonstrates that the weighted distribution of NLTS2 youth very closely approximates that of youth with disabilities in the nation. Thus, weighted findings from NLTS2 provide an accurate picture of the characteristics, experiences, and achievements of youth with the range of disabilities highlighted in Exhibit C-1.

<sup>2</sup> General student enrollment is available by grade level rather than age. Grades 7 through 10 were used in calculating the general student enrollment (National Center for Education Statistics, 2001).

<sup>3</sup> Data are for youth ages 13 to 16 who were receiving services under IDEA, Part B, in the 2000-01 school year in the 50 states and Puerto Rico (Office of Special Education Programs, 2002).



## Age

Although the youth included in NLTS2 were ages 13 through 16 when they were selected, by the time data were collected from parents, some of the 13-year-olds were 14 and some 16-year-olds were 17. Therefore, findings are reported here for youth who are 13 through 17 (Exhibit C-2). The youngest and oldest cohorts, 13 and 17, are smaller than others because of the aging of youth between sample selection and interviews.

Each successive age cohort includes youth who were identified as eligible for special education services at that age, as well as those identified earlier who still are receiving special education. However, each age cohort does not include students who left school or special education at earlier ages. Thus, the disability mix shifts across the age cohorts because some disabilities are more prevalent among younger students whereas others do not emerge until later, and because school-leaving disproportionately affects some disability categories.

Youth in each disability category are distributed across the age groups in a similar pattern, with one exception. Almost half (45%) of youth with speech impairments are ages 13 or 14, making them significantly younger as a group than those in almost every other disability category ( $p < .001$ ).

**Exhibit C-2**  
**YOUTH'S AGE ON JULY 1, 2001, BY DISABILITY CATEGORY**

Age	All Youth	Learning Disability	Speech/ Language Impairment	Mental Retardation	Emotional Disturbance	Hearing Impairment	Visual Impairment	Ortho- pedic Impairment	Other Health Impairment	Autism	Traumatic Brain Injury	Multiple Disabili- ties	Deaf- Blindness
13 or 14	31.1 (1.4)	31.5 (2.2)	44.9 (2.4)	27.0 (2.2)	29.7 (2.3)	29.4 (2.6)	28.4 (3.1)	28.3 (2.5)	32.7 (2.2)	33.1 (2.5)	26.1 (4.0)	26.7 (2.3)	35.7 (4.7)
15	23.4 (1.3)	24.0 (2.1)	22.5 (2.0)	23.2 (2.1)	22.0 (2.1)	21.1 (2.3)	21.7 (2.9)	24.0 (2.3)	21.9 (1.9)	23.2 (2.2)	22.0 (3.8)	21.6 (2.2)	22.2 (4.0)
16	26.7 (1.4)	26.6 (2.1)	19.9 (1.9)	28.8 (2.2)	26.8 (2.2)	27.0 (2.5)	27.3 (3.1)	26.9 (2.4)	27.0 (2.1)	26.0 (2.3)	32.7 (4.3)	31.0 (2.4)	20.1 (3.9)
17	18.8 (1.2)	18.0 (1.8)	12.7 (1.6)	21.1 (2.0)	21.6 (2.1)	22.5 (2.3)	22.6 (2.9)	20.7 (2.2)	18.4 (1.8)	17.7 (2.0)	19.2 (3.6)	20.7 (2.1)	22.0 (4.0)

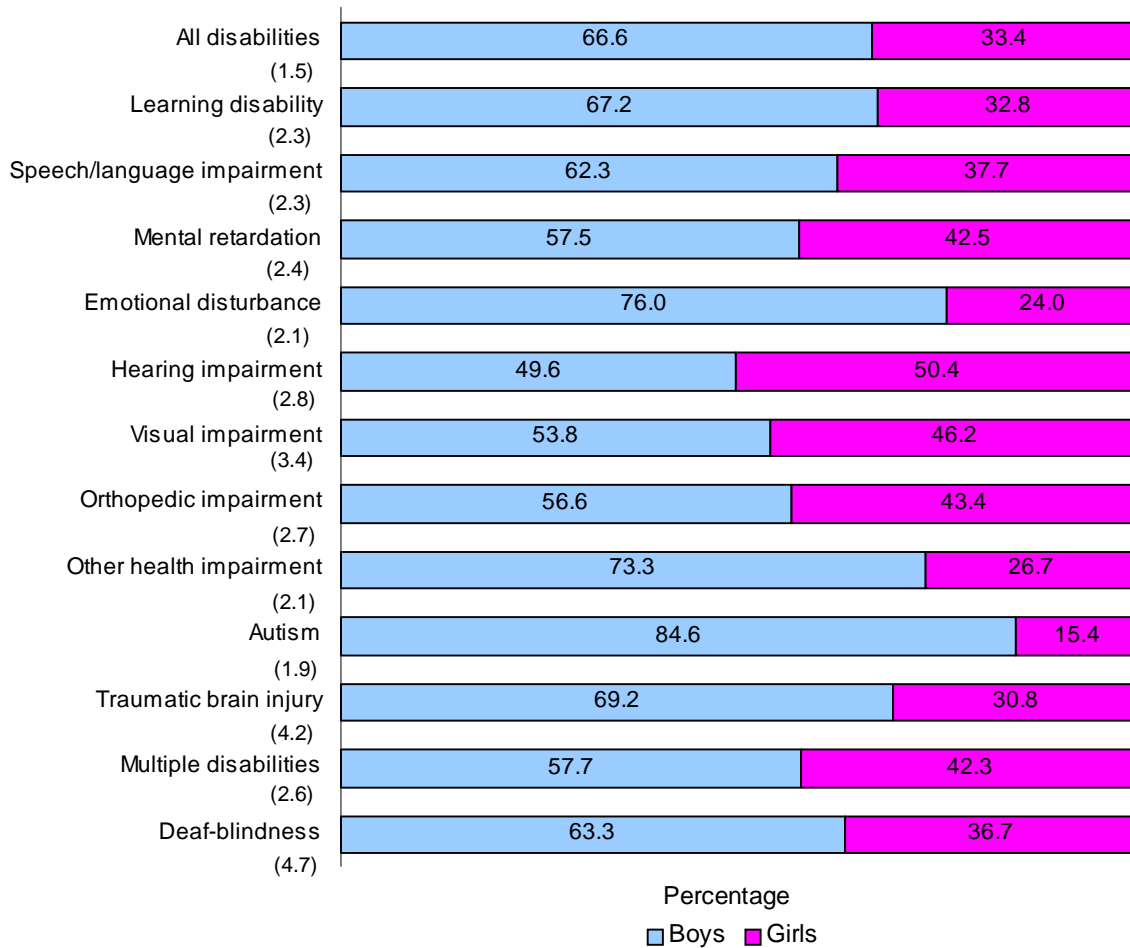
Source: NLTS2 Wave 1 parent interviews.  
Standard errors are in parentheses.

## Gender

Two-thirds of youth with disabilities in the NLTS2 age range are boys (Exhibit C-3). The 2:1 ratio among children with disabilities has been found among infants and toddlers (Hebbeler et al., 2001), as well as among elementary and middle school students (Marder & Wagner, 2002).

Boys make up between 58% and 77% of youth in most disability categories, but among youth with autism, 85% are boys. In contrast, among youth with hearing or visual impairments, the percentages come close to the distribution of boys in the general population (50% and 54%). Thus, youth with different disability classifications can be expected to differ in their experiences and achievements because of their gender composition, as well as their disability differences.

### Exhibit C-3 STUDENT GENDER, BY DISABILITY CATEGORY



Source: NLTS2 Wave 1 parent interview s.  
Standard errors are in parentheses.

### Race/Ethnicity

Although white students make up approximately the same percentage of youth with disabilities as they do of the general population, differences are apparent between the two populations for youth of color, particularly African American youth (Exhibit C-4). They constitute almost 21% of youth with disabilities, compared with 17% of youth in the general population ( $p < .01$ ).<sup>4</sup> This finding is consistent with research that has demonstrated that disability is most prevalent among African Americans across the age range (Bradsher, 1995). Small differences between youth with disabilities and youth in the general population in other racial/ethnic groups are not statistically significant.

<sup>4</sup> National Center for Education Statistics (2002).

### Exhibit C-4

#### RACIAL/ETHNIC BACKGROUNDS OF YOUTH, BY DISABILITY CATEGORY

Percentage whose race/ ethnicity is:	All Youth	Learning Disability	Speech/ Language Impair- ment	Mental Retarda- tion	Emotional Distur- bance	Hearing Impair- ment	Visual Impair- ment	Ortho- pedic Impair- ment	Other Health Impair- ment	Autism	Traumatic Brain Injury	Multiple Dis- abilities	Deaf- Blind- ness
White	62.1 (1.5)	62.3 (2.3)	64.7 (2.3)	54.8 (2.4)	61.4 (2.4)	59.9 (2.8)	62.1 (3.4)	64.3 (2.6)	76.6 (2.0)	62.0 (2.6)	68.5 (4.2)	65.6 (2.5)	62.4 (4.7)
African American	20.7 (1.3)	18.4 (1.9)	17.7 (1.8)	33.3 (2.3)	25.0 (2.2)	17.5 (2.1)	20.1 (2.8)	15.5 (2.0)	13.3 (1.6)	23.7 (2.3)	17.9 (3.5)	18.4 (2.1)	14.7 (3.4)
Hispanic	14.1 (1.1)	16.2 (1.8)	14.2 (1.7)	9.6 (1.4)	10.2 (1.5)	17.3 (2.1)	14.0 (2.4)	16.4 (2.0)	7.7 (1.2)	8.9 (1.5)	10.0 (2.7)	11.6 (1.7)	19.5 (3.9)
Asian/Pacific Islander	1.3 (.4)	1.0 (.5)	2.1 (.7)	1.2 (.5)	1.4 (.6)	4.1 (1.1)	3.0 (1.2)	3.2 (1.0)	1.2 (.5)	4.0 (1.0)	2.3 (1.4)	1.8 (.7)	2.9 (1.6)
American Indian/ Alaska Native	1.2 (.3)	1.3 (.5)	.9 (.5)	.5 (.3)	1.6 (.6)	1.2 (.6)	.3 (.4)	.4 (.3)	.7 (.4)	.7 (.4)	1.2 (1.0)	2.3 (.8)	.0 (.0)

Source: NLTSS Wave 1 parent interviews.  
Standard errors are in parentheses.

The disproportionality of African Americans among youth with disabilities is concentrated in a few categories. Whereas the racial/ethnic composition of youth with learning disabilities; speech, hearing, or orthopedic impairments; or multiple disabilities resembles the general population, African Americans comprise significantly larger percentages of youth with mental retardation (33%) and emotional disturbances (25%). The percentage of Hispanic youth is particularly small among those with other health impairments (8%) or autism (9%). These racial/ethnic differences between disability categories may contribute to differences in the experiences of youth, apart from their differences in disability.

### Household Risk Factors

A child's household is his or her first educational setting. At home, children form their first emotional attachments, achieve their early developmental milestones, and acquire the foundation for their subsequent growth and learning. During adolescence, the family can be the context within which a youth wrestles with his or her desire for independence and separation, and the need to stay connected to family and home. Thus, as children grow up, what they need from their families and others who share their households may change, but children and youth continue to have their values, expectations, and preferences shaped by their experiences at home.

This section examines several aspects of households that can be risk factors in children's development: living with other than two parents, having a poorly educated or unemployed head of household, or living in a low-income household (see for example, Duncan & Brooks-Gunn, 1997). These factors are described for youth with disabilities as a whole compared with the general population, and then for youth who differ in their primary disability classification.

**Exhibit C-5  
HOUSEHOLD CHARACTERISTICS OF  
YOUTH WITH DISABILITIES AND YOUTH  
IN THE GENERAL POPULATION**

	Youth with Disabilities	Youth in the General Population
Percentage living:		
With two parents	61.4 (1.6)	73.8 <sup>a</sup> (1.0)
With one parent	31.1 (1.5)	22.5 <sup>a</sup> (1.0)
With relative(s)	5.3 (.7)	3.2 (.4)
With a legal guardian/not a relative	1.1 (.3)	<sup>b</sup>
In foster care	1.0 (.3)	<sup>b</sup>
In another arrangement	.3 (.1)	.5 (.2)
Percentage with:		
Head of household who is not a high school graduate	21.0 (1.3)	10.0 <sup>c</sup> (.6)
Unemployed head of household	17.0 (1.2)	11.0 <sup>c</sup> (.6)
Percentage with annual household income of:		
\$25,000 or less	36.6 (1.6)	19.7 <sup>d</sup>
\$25,001 to \$50,000	30.0 (1.5)	25.5
More than \$50,000	33.4 (1.5)	54.6
Percentage in poverty	23.5 (1.4)	16.3 <sup>e</sup>

Source: NLTS2 Wave 1 parent interviews.

<sup>a</sup> Computed using data for 13- to 17-year-olds from the National Longitudinal Study of Adolescent Health, 1999.

<sup>b</sup> Youth living with a legal guardian, in foster care, or in residential school or institution are included in the "other arrangement" category.

<sup>c</sup> Computed using data for 13- to 17-year-olds from the National Household Education Survey, 1999.

<sup>d</sup> Data are for youth 12 through 17 years old. U.S. Census Bureau (2002a).

<sup>e</sup> U.S. Census Bureau (2002b).

Standard errors are in parentheses.

**Household Risk Factors for Youth  
with Disabilities and the General  
Population**

Like youth in the general population, a majority of youth with disabilities (61%) live in households with two parents (either biological, step, or adoptive parents, Exhibit C-5). This is substantially below the 74% of youth in the general population who do so ( $p < .001$ ). Another 31% live with one parent. Thus, 92% of youth with disabilities live with a parent. Five percent of youth live with other adult family members in households that do not include one of their own parents, and 1% live with a legal guardian who is not a family member. One percent of youth with disabilities live in foster care; few live at a residential school or institution.<sup>5</sup>

The heads of household of youth with disabilities tend to have lower levels of education than parents of the general population of youth. In the general population, 10% of heads of household are not high school graduates, whereas more than twice as many heads of household of youth with disabilities have not graduated from high school ( $p < .001$ ). Similarly, heads of households of youth with disabilities are more likely to be unemployed (17%) than those in the general population (11%,  $p < .001$ ).

Consistent with lower education levels and rates of employment, youth with disabilities are more likely than others to be poor. Almost one-fourth of them live in poverty, compared with about 16% of youth in the general population ( $p < .001$ ). Poverty has been shown to have negative impacts on children and youth with disabilities and their

families in multiple domains, including health, productivity, physical environment, emotional well-being, and family interaction (Park, Turnbull, & Turnbull, 2002).

<sup>5</sup> These include residential or boarding schools, hospitals, mental health facilities, group homes, and correctional facilities.

## Disability Differences in Household Risk Factors

The prevalence of risk factors among households of youth with different disabilities shows quite a wide range (Exhibit C-6). Most striking, youth with mental retardation are more likely than others to experience high levels of each kind of risk, as are youth with emotional disturbances to a somewhat lesser degree. These youth are the least likely to live with two parents and among the most likely to live in foster care. They also are the most likely to come from households in poverty and those with heads of household who are not employed.

In contrast, youth with other health impairments have the lowest rates of some kinds of risk factors. For example, they are among the least likely to be living in poverty or in a household where the head of household is unemployed, and most likely to be living with two parents. In fact, they are somewhat less likely to experience some of these risk factors than youth in the general population. Youth with physical and sensory impairments are in the mid-range among the disability categories on many risk factors.

**Exhibit C-6**  
**HOUSEHOLD CHARACTERISTICS, BY DISABILITY CATEGORY**

	Learning Disability	Speech/ Language Impairment	Mental Retardation	Emotional Disturbance	Hearing Impairment	Visual Impairment	Orthopedic Impairment	Other Health Impairment	Autism	Traumatic Brain Injury	Multiple Disabilities	Deaf-Blindness
<b>Living:</b>												
With both parents	63.3 (2.4)	69.7 (2.3)	54.8 (2.6)	48.7 (2.6)	65.8 (2.8)	61.0 (3.5)	66.9 (2.7)	71.9 (2.2)	67.5 (2.5)	61.2 (4.5)	63.6 (2.6)	60.3 (5.2)
With one parent	30.6 (2.3)	24.8 (2.2)	34.5 (2.5)	38.1 (2.6)	26.0 (2.6)	30.7 (3.3)	27.4 (2.5)	22.2 (2.0)	27.0 (2.4)	30.3 (4.2)	24.9 (2.4)	35.7 (5.1)
With relative(s)	5.0 (1.1)	3.5 (.9)	6.2 (1.3)	7.9 (1.4)	5.3 (1.3)	5.8 (1.7)	3.6 (1.1)	2.8 (.8)	2.3 (.8)	5.7 (2.1)	4.3 (1.1)	3.4 (1.9)
With a legal guardian (not a relative)	.6 (.4)	.6 (.4)	2.3 (.8)	2.2 (.8)	2.5 (.9)	2.0 (1.0)	1.1 (.6)	1.0 (.5)	1.1 (.6)	1.6 (1.2)	2.3 (.8)	.0 (.0)
In foster care	.5 (.4)	1.2 (.5)	1.8 (.7)	2.8 (.9)	.3 (.3)	.1 (.2)	.5 (.4)	1.7 (.6)	1.7 (.7)	.9 (.9)	2.6 (.9)	.0 (.0)
In another arrangement	.1 (.2)	.1 (.2)	.4 (.3)	.4 (.4)	.2 (.4)	.3 (.4)	.4 (.5)	.3 (.4)	.4 (.4)	.2 (.6)	2.3 (.9)	.7 (.9)
<b>With head of household who is:</b>												
Not a high school graduate	20.3 (2.0)	19.7 (2.0)	32.3 (2.4)	19.5 (2.1)	18.3 (2.3)	15.1 (2.6)	14.9 (2.0)	13.3 (1.6)	11.2 (1.7)	15.1 (3.4)	14.2 (1.9)	18.4 (3.9)
Not employed	14.0 (1.7)	14.8 (1.8)	28.2 (2.3)	24.0 (2.3)	14.2 (2.1)	17.5 (2.8)	16.3 (2.1)	12.5 (1.6)	16.0 (2.0)	17.0 (3.6)	20.1 (2.2)	19.4 (4.0)
In poverty	22.1 (2.1)	19.2 (2.1)	41.4 (2.6)	29.8 (2.4)	20.2 (2.4)	19.7 (2.9)	20.4 (2.4)	15.0 (1.8)	15.0 (1.8)	18.8 (3.6)	24.0 (2.5)	24.3 (4.7)

Source: NLTS2 Wave 1 parent interviews.  
Standard errors are in parentheses.

## Summary

Youth with disabilities constitute 13% of all 13- to 16-year-olds who were enrolled in school in the 2000-01 school year. Although they include students with 12 different primary disability classifications, 85% are classified as having either learning disabilities, mental retardation, or emotional disturbances as their primary disabilities.

NLTS2 youth were 13 to 17 years old when parent interview data were collected. Youth with speech/language impairments have a larger proportion of younger students, whereas visual impairment is a category that has a larger proportion of older students.

Almost two-thirds of youth with disabilities are boys. Boys are little more than half of youth with sensory impairments, but they are about three-fourths of youth with emotional disturbances and other health impairments and more than 80% of youth with autism.

African American youth are a larger proportion of youth with disabilities relative to the general population. This difference between the two populations of youth is consistent with patterns found among infants and toddlers with disabilities or developmental delays, as well as among elementary- and middle-school-age students receiving special education. However, disproportionality is concentrated among youth in a limited number of disability categories. African Americans make up particularly large proportions of those with mental retardation or emotional disturbances. The percentage of Hispanic youth is particularly small among those with other health impairments or autism.

The households of youth with disabilities also differ significantly from the general population in the prevalence of several risk factors for poor outcomes. Of particular note is the significantly higher rate of low-income households among youth with disabilities, probably a reflection, in part, of the overall lower levels of education and employment among heads of households of youth with disabilities. Several risk factors are particularly prominent among youth with mental retardation and emotional disturbances.

Awareness of these important differences between youth with disabilities and those in the general population, and of the highlighted differences between youth with different primary disability classifications, is an important foundation for understanding the experiences described in this report.

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## Appendix D

### UNWEIGHTED SAMPLE SIZES

#### Exhibit D-1

#### EXHIBITS FOR YOUTH WITH DISABILITIES: EXHIBITS 3-1, 3-2, 3-3, 3-5, 3-6, 3-7, 4-7, 4-8, 4-9, 5-2, 5-3, 5-4, 5-8, 5-9, 5-10, 6-1, 6-2, 6-3, 6-4, 6-5, 6-6, 6-7, 6-15, 6-15, 6-17

	Sample Size		Sample Size
Exhibit 3-1		Exhibit 5-2	
Youth enjoys school	8,704	Controls behavior to act appropriately	5,464
Absenteeism	4,834	Follows directions	5,462
Exhibit 3-2		Exhibit 5-3	
Stays focused on class work in:		Progress toward transition goals	
All types of classes	5,456	Social/interpersonal goals	3,195
General education academic class	2,559	Behavior management goals	2,387
Vocational education class	3,340		
Special education class	3,332	Exhibit 5-4	
Completes homework on time in:		Belongs to school/community group	9,001
All types of classes	4,994	Frequency of seeing friends	8,581
General education academic class	2,495	Social engagement	8,792
Vocational education class	3,072		
Special education class	2,637	Exhibits 5-8 through 5-10	
Participates in group discussion in:		Belongs to a group	3,909
All types of classes	5,236	Sees friends frequently	3,834
General education academic class	2,522	Disciplinary actions at school	3,647
Vocational education class	3,240	Arrests	3,935
Special education class	2,993	Exhibit 6-1	
Withdraws from social contact in:		Feeds self	9,128
All types of classes	5,460	Dresses self	9,127
General education academic class	2,560	Self-care scale score	9,124
Vocational education class	3,333	Exhibit 6-2	
Special education class	3,331	Reads and understands common signs	8,949
Exhibit 3-3		Tells time on an analog clock	8,948
Classroom engagement scale		Counts change	8,954
General education academic class	2,495	Looks up telephone numbers and uses the phone	8,946
Vocational education class	3,072	Functional cognitive skills scale score	8,936
Special education class	2,637	Exhibit 6-3	
Exhibits 3-5 through 3-7		Gets around outside the home	8,478
Absenteeism	3,196	Mobility scale score for youth with visual impairments	468
Classroom engagement scale		Exhibit 6-4	
General education academic class	1,668	Persistence	8,961
Vocational education class	2,265	Self-advocacy	5,865
Special education class	2,156	Exhibit 6-5	
Exhibit 4-1		Role in transition plan	4,124
Student grades	6,371	Progress toward transition goal related to:	
Students expected to keep up in general education academic classes	2,107	Independent living	3,404
Students do keep up in general education academic class	2,550	Employment	3,550
Exhibits 4-7 through 4-9		Self-advocacy	3,253
Grades	3,186		
Grade levels behind in reading	2,004		
Grade levels behind in math	1,872		

**Exhibit D-1**  
**EXHIBITS FOR YOUTH WITH DISABILITIES: EXHIBITS 3-1, 3-2, 3-3, 3-5, 3-6, 3-7, 4-7, 4-8, 4-9, 5-2, 5-3, 5-4, 5-8, 5-9, 5-10, 6-1, 6-2, 6-3, 6-4, 6-5, 6-6, 6-7, 6-15, 6-15, 6-17**

	Sample Size		Sample Size
Exhibit 6-6			
Fix own breakfast or lunch	8,971	Exhibit 6-7	
Straighten up own living area	8,970	Has driver's license or learner's permit	5,833
Buy items needed at a store	8,973	Had paid job in past year	8,612
Do laundry	8,970	Part of year in which youth worked	8,609
Household responsibilities scale score	8,966	Exhibits 6-15 through 6-17	
Gets an allowance/has own money	8,762	Household responsibilities	7,405
Has savings account	8,746	Paid employment	3,304
Has charge account or credit card	3,674		

**Exhibit D-2**  
**EXHIBITS FOR DISABILITY CATEGORIES: EXHIBIT 3-5, 4-4, 4-5, 4-6, 5-7, 6-12, 6-13, AND 6-14**

	Learning Dis- ability	Speech/ Language Impair- ment	Mental Retar- dation	Emo- tional Disturb- ance	Hearing Impair- ment	Visual Impair- ment	Ortho- pedic Impair- ment	Other Health Impair- ment	Autism	Trau- matic Brain Injury	Multiple Disabili- ties	Deaf- Blind- ness
Exhibit 3-5												
Youth enjoys school	838	818	809	779	815	648	872	884	873	358	867	143
Absenteeism	475	407	497	297	490	413	499	499	519	187	457	94
Classroom engagement scale												
General education academic class	357	349	131	176	219	144	305	391	149	98	87	23
Vocational education class	308	230	374	173	366	211	293	303	300	119	279	55
Special education class	299	196	353	199	154	86	292	309	262	127	237	24
Exhibit 4-4												
Student grades	664	640	581	590	664	467	708	712	543	289	426	87
Exhibit 4-5												
Student expected to keep up with class	293	290	115	154	192	132	269	336	135	86	82	23
Student keeps up with class	371	365	136	187	223	150	324	412	157	104	96	23
Exhibit 4-6												
Discrepancy between reading tests and grade level	368	217	335	204	374	203	296	326	234	124	219	47
Discrepancy between mathematics tests and grade level	330	205	319	199	342	185	279	312	218	117	198	39

**Exhibit D-2**  
**EXHIBITS FOR DISABILITY CATEGORIES: EXHIBIT 3-5, 4-4, 4-5, 4-6, 5-7,**  
**6-12, 6-13, AND 6-14 (CONCLUDED)**

	Learning Dis- ability	Speech/ Language Impair- ment	Mental Retar- dation	Emo- tional Disturb- ance	Hearing Impair- ment	Visual Impair- ment	Ortho- pedic Impair- ment	Other Health Impair- ment	Autism	Trau- matic Brain Injury	Multiple Disabili- ties	Deaf- Blind- ness
Exhibit 5-7	801	782	784	748	780	617	839	843	844	340	857	153
Social skills scale score	846	833	819	801	824	649	878	901	864	361	861	151
Classroom behavior scale score												
Belongs to groups	858	843	839	810	835	660	902	909	911	367	907	160
Gets together with friends	831	809	795	759	799	623	867	875	866	362	857	138
Social engagement												
Has bullied others	820	810	780	738	795	634	844	850	855	348	840	137
Subject to disciplinary action at school												
Ever arrested	836	808	798	786	813	651	867	877	885	360	887	144
Progress toward social/interpersonal transition goal	255	164	385	250	290	292	290	311	418	127	352	61
Progress toward behavior management goal	197	112	285	253	203	188	155	256	347	99	249	43
Exhibit 6-12												
Self-care skill scale	878	866	852	832	862	668	899	916	912	367	913	161
Functional cognitive skills scale	853	834	832	805	833	657	893	905	906	362	904	154
Mobility												
Persistence	854	839	836	812	835	661	894	907	907	363	896	159
Self-advocacy												
Exhibit 6-12												
Progress toward transition goal related to:												
Independent living	330	203	393	225	398	313	342	359	333	142	310	56
Employment	367	224	403	237	383	300	324	384	378	140	347	63
Self-advocacy	316	201	361	234	335	307	333	338	332	132	305	59
Exhibit 6-13												
Household response- bilities scale score	852	835	835	810	836	663	894	907	909	363	904	160
Has allowance	840	815	802	793	815	652	874	885	888	364	889	145
Has savings account	839	815	801	790	815	650	870	883	888	363	887	145
Has checking account	840	815	804	790	815	651	873	885	888	364	888	145
Has credit card/charge account	361	252	367	387	377	282	354	390	325	141	381	57
Exhibit 6-14												
Has driver's license or learner's permit	560	439	569	557	565	435	602	607	562	237	609	91
Had paid job in past year	829	803	797	777	800	636	860	875	873	358	865	139
Has paid job currently	831	806	799	787	802	646	865	880	885	360	884	144

**Exhibit D-3**  
**EXHIBITS FOR CORRELATIONS: EXHIBITS 3-4, 4-3, 5-5, 6-9, 6-10, AND 6-11**

Exhibit 3-4	Youth Enjoys School	Classroom Behavior Scale
Absences excluding suspensions	4,025	4,620
Youth enjoys school	--	4,386

Exhibit 4-3	Grades	Tested Reading Performance Compared with Grade Level	Tested Mathematics Performance Compared with Grade Level
Keeps up with the class	3,298	1,774	1,643
Grades	--	2,690	2,504
Performance tested performance in reading compared with grade level	--	--	2,701

Exhibit 5-5	Classroom Social Behavior Scale	Gets Along with Teachers and Students	Belongs to a Group	How Often Sees Friends Outside of Groups	Has Received Disciplinary Action in the Current School Year	Has Bullied Others at school	Has Been Arrested
Social skills scale score	4,583	8,385	8,776	8,398	8,593	8,196	8,544
Classroom social behavior scale score	--	4,543	4,685	4,475	5,656	4,451	4,548
Gets along with teachers and students	--		8,573	8,400	8,629	8,403	8,511
Belongs to a group	--	--	--	8,576	8,809	8,371	8,704
How often sees friends outside of groups	--	--	--	--	8,513	8,203	8,519
Has received disciplinary action in the current school year	--	--	--	--	--	8,427	8,638
Has bullied others at school	--	--	--	--	--	--	8,311

Exhibit 6-9	Functional Cognitive Skills	Mobility	Persistence	Self- advocacy
Self-care skills	8,930	8,464	8,950	4,710
Functional cognitive skills	--	8,449	8,907	4,629
Mobility	--	--	8,443	4,377
Persistence	--	--	--	4,641

**Exhibit D-4**  
**EXHIBITS FOR CORRELATIONS: EXHIBITS 3-4, 4-3, 5-5, 6-9, 6-10, AND 6-11**  
**(CONCLUDED)**

Exhibit 6-10

	Progress toward Goal Related to:			Assuming Responsibilities for Daily Living	
	Independent Living	Vocationally-Oriented goals	Self-advocacy	Household Responsibilities	Financial Responsibilities
Self-care skills	2,933	2,933	2,801	8,955	8,743
Functional cognitive skills	2,875	2,997	2,747	8,927	8,647
Mobility	2,712	2,835	2,596	8,462	8,223
Persistence	2,888	3,011	2,764	8,937	8,707
Self-advocacy	3,456	3,622	3,332	4,642	5,865
Progress toward transition goal related to:					
Independent living	--	3,085	3,084	2,889	2,839
Employment	--	--	3,622	3,011	2,953
Self-advocacy	--	--	--	2,763	2,714

Exhibit 6-11

	Youth Has Driving Privileges		Youth Has a Regular Paid Job	
	Yes	No	Yes	No
Average self-care skills scale score	1,131	4,694	3,234	5,370
Average functional cognitive skills scale score	1,132	4,678	3,230	5,345
Percentage who get around outside the house "very well"	1,126	4,400	3,175	4,941
Percentage who persist with tasks "very often"	1,133	4,680	3,237	5,350
Percentage who self-advocate "very well"	602	2,460	1,716	2,777
Percentage making "some" or "a lot of progress" toward transition goal related to:				
Independent living	400	1,693	1,079	1,715
Employment	415	1,759	1,111	1,795
Self-advocacy	386	1,630	1,013	1,662
Average household responsibilities scale score	1,133	4,690	3,235	5,361
Average number of financial management responsibilities	1,134	4,692	3,231	5,367

**Exhibit D-4**  
**OTHER EXHIBITS: 4-2, 5-1, 5-6**

**Exhibit 4-2**

	<u>Reading</u>	<u>Mathematics</u>
Grade-level discrepancy between students' tested and actual grade levels	2,947	2,743

**Exhibit 5-1**

	<u>Youth with Disabilities</u>	<u>Youth in the General Population</u>
Percentage of youth with frequency of activity:		
Makes friends easily	8,968	174
Starts conversations rather than waiting for others to start	8,959	174
Joins group activities, such as a group having lunch together, without being told to do so	8,961	174
Speaks in an appropriate tone at home	8,962	174
Avoids situations that are likely to result in trouble	8,921	174
Controls his or her temper when arguing with peers other than siblings	8,849	174
Ends disagreements with parent calmly	8,882	174
Receives criticism well	8,851	174
Seems confident in social situations, such as parties or group outings	8,955	174

**Exhibit 5-6**

	<u>Youth Whose Social Skills Are Rated:</u>		
	<u>Low</u>	<u>Medium</u>	<u>High</u>
Classroom social behavior rating			
How well youth get along with others	2,560	5,093	734
Percentage who:			
Belong to a group	2,710	5,295	749
See friends outside of groups at least weekly	2,581	5,076	743
Bully others	2,479	4,990	729
Have been the subject of a disciplinary action at school in the last year	2,648	5,196	749
Have been involved with the criminal justice system	2,638	5,157	749