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ENGAGEMENT, ACADEMICS, SOCIAL ADJUSTMENT, AND INDEPENDENCE: THE ACHIEVEMENTS OF ELEMENTARY AND MIDDLE SCHOOL STUDENTS WITH DISABILITIES

Prepared for:

Dr. Lisa Holden-Pitt
Office of Special Education Programs
U.S. Department of Education

SRI Project P10656

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EXHIBITS

1. Assessing the Achievements of Students with Disabilities during Elementary and Middle School

By Mary Wagner and Jose Blackorby

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 for the academic performance of all their students. NCLB requires states to implement statewide accountability systems that are based on challenging academic standards in core areas, to test all students in grades 3 through 8 annually, and to publish statewide progress objectives annually to ensure that all groups of students reach academic proficiency within 12 years.

This emphasis on improved academic performance is consistent with the intention of federal legislation that guides the provision of special education services for children 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)]. The importance of academic performance is not the ultimate outcome by which the education of students with disabilities is to be assessed, however. The intention of the free appropriate public education guaranteed by IDEA to children 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 with disabilities. In fact, the National Center on Educational Outcomes (1993) has articulated six primary outcome domains relevant to students with disabilities in a "framework for educational accountability." Yet, specifying desired outcomes is only a first step toward an effective accountability system; only when data are available on how students 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 6-year study that is generating the information needed to assess the achievements of students with disabilities in their elementary and middle school years in multiple domains. The Special Education Elementary Longitudinal Study (SEELS) is documenting the characteristics, experiences, and outcomes of a nationally representative sample of more than 11,000 students who were ages 6 through 12 and were receiving special education services in grades 1 through 6 when the study began in 2000. SEELS findings are generalizable to students with disabilities nationally, and to students

in each of the federal special education disability categories in use for students in the SEELS age range.[1]

This rich source of information will support a series of reports that will emerge over the life of SEELS. This report considers the following questions concerning elementary and middle school students with disabilities:[2]

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

Student Outcomes

SEELS 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**—gaining proficiency in reading, in mathematics, and in making progress in the curriculum.
- **Social adjustment**—exhibiting social skills, being socially integrated, and avoiding negative behavior.
- **Independence**—demonstrating skills that support emerging independence and assuming responsibilities at home.

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

- **Parents.** In telephone interviews conducted in 2000, parents reported on such topics as the activities of students outside of school (e.g., getting together with friends, extracurricular activities), students' functioning (e.g., social skills, self-care skills), household characteristics (e.g., income), and their expectations for their children's future.
- **Students.** In-person assessments were conducted with students during the 2000-01 school year. These assessments collected data from students, including the scores of tests administered to the students in reading, mathematics, phonemic awareness, and oral reading fluency, as well as

[1] Please see Appendix A for details about the SEELS design, sample, analysis approach, and measurement issues. Additional information about SEELS is available at www.seels.net.

[2] Similar questions are addressed for secondary-school-age students with disabilities in Wagner, Marder, Blackorby, Cameto, Newman, Levine, et al. (2003).

information regarding students' academic and social self-concept and attitudes toward school.

- **School staff best able to describe students' overall school programs and performance.** A mail questionnaire administered in the 2000-01 school year generated information on absenteeism; tested grade levels in reading and mathematics; suspensions, expulsions, and disciplinary actions; course-taking; grades; and accommodations and services provided to students as part of their school programs.
- **Teachers of language arts classes.** A mail questionnaire administered in the 2000-01 school year and completed by students' primary language arts teacher collected information on instructional goals and methods, accommodations, and student performance and behavior in such classes.
- **School staff able to describe students' schools.** A mail questionnaire administered in the 2000-01 school year collected information on the characteristics of schools attended by students with disabilities, including their student bodies, resources, and policies.
- **School districts.** The primary disability classification of each student was obtained from the school district rosters from which students were sampled.

The synthesis of these data sources has produced information to measure the following outcomes within each domain:

School Engagement

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

- **Students' feelings toward school.** Students who have positive feelings about school are more likely than other students to attend school and to participate fully in their educational experience. To measure student's feelings about school, parents were asked to indicate their children's level of agreement with the statement, "[Student'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 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 students were absent in February 2001. That value was multiplied by nine for the average days absent in a school year. Suspensions and expulsions were excluded from this calculation.
- **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 do the following: complete homework on time, take part in group discussions, perform difficult tasks independently, and persevere until completing a difficult task. Responses were summed to create a scale that ranges from 4 (does all activities "rarely") to 16 (does all activities "almost always").

- **Motivation for schooling.** Students who are motivated to attend school may be more likely to continue attending school and to obtain a diploma. Students responded to a series of questions during the direct assessment from the School Attitude Measure (Wick, 1990) that included responses to statements such as: "School is the best place for me to learn," "I look forward to each new school year," and "I am glad that I have many more years of school."

Academic Performance

- **Standardized test scores.** Students' performance in reading and mathematics was measured through the SEELS in-person direct assessment in the 2000-01 school year. The assessment contained research editions of four subtests of the Woodcock Johnson III (WJIII) assessment (Woodcock, McGrew, & Mather, 2001), including letter-word identification, passage comprehension, mathematics calculation, and mathematics problem-solving. WJIII allows for direct comparisons with a general population norm group assessed in 2000.
- **Grades.** Parents were asked to report students' overall grades on a 9-point scale (e.g., mostly As, mostly As and Bs, mostly Bs). For students whose parents were not interviewed, teachers' reports of the grades they gave students in their language arts classes were used (recorded on the same 9-point scale). Only students who received these kinds of letter grades (as opposed to grades such as "excellent" or "passing") are included in analyses of grades as a dependent measure.
- **Discrepancy between actual grade level and tested grade level in reading and in mathematics.** Over time, students who do not learn effectively fall increasingly behind in their academic skills. To assess the extent to which students 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. Each student's actual grade level in that year then was subtracted from the tested grade level in the test 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.
- **Grade retention.** A fundamental measure of academic achievement is meeting the performance expectations for a given grade level and being promoted to the next grade level at the end of the school year. Students who do not meet expectations repeat a grade, an experience that is becoming more

common as policies that prohibit "social promotion" proliferate (Smink, 2001). Parents were asked whether their children with disabilities had ever been held back a grade.

Social Adjustment

- **Social skills.** Students with disabilities differ markedly in their ability to relate to others (Cadwallader, Cameto, Blackorby, Giacalone, & Wagner, 2002), 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 students with disabilities were assessed by asking parents questions about the frequency with which students exhibit nine aspects of social interactions, which were drawn from the Social Skills Rating System, Parent Form (Gresham & Elliott, 1990a).[3] A summative scale for the items ranges from 9 ("never" exhibits any of the skills) to 27 (exhibits all of the skills "always").
- **Classroom behavior.** To elicit information about students' classroom behavior from the schools' point of view, SEELS asked teachers or school staff how well students "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 3 (all behaviors done "not at all well") to 12 (all behaviors done "very well").
- **Getting along with teachers and students at school.** Parents were asked to report how well they think students 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.** School staff were asked whether during the current school year students with disabilities had been suspended, expelled, or involved in any other type of disciplinary action, such as a referral to the office or detention.
- **Social integration.** Parents reported on students' involvement with peers in organized extracurricular activities, as well as informal friendships. They indicated whether students participate 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 students' group, or a nonschool sports team. Parents also were asked how many days a week their children with disabilities usually get together with friends outside of school and organized activities or groups.

[3] Please see Chapter 5 for the specific social skills included in this scale.

Independence

Skills That Support Independence

- **Management of self-care activities.** Although most students who receive special education services have mastered the skills involved in such basic self-care functions as toileting and feeding themselves, those functions continue to challenge some students. Parents' reports of the ability of students 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 students with disabilities, including those with cognitive impairments and some kinds of learning disabilities. Parents' reports on the ability of students 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 as "functional cognitive skills" because they require the cognitive ability to read, to count, and to calculate. However, they also require sensory and motor skills (e.g., the ability to see signs, to 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 students to navigate the nearby environment outside their homes was assessed using parents' ratings of how well students are 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 students with visual impairments, information on mobility skills was collected for all students identified as having those impairments. School staff were asked to report how well students with visual impairments are able to perform 10 mobility activities (e.g., travel indoors using remotely learned routes, execute a route indicated by a verbal set of directions). A composite mobility performance score was calculated by summing these responses, which ranges from 10 to 30.

- **Self-determination and locus of control.** The road to independence for children and adolescents also includes the development of self-determination and locus of control skills, such as persisting with tasks to completion or believing in one's ability to advocate for oneself and influence one's success. To assess persistence, parents and teachers[4] were asked how often students "keep working at something until finished, even if it takes a long time." Responses included "very often," "sometimes," and "never." Self-advocacy

[4] In measuring persistence, data from teachers has been used when a parent report was missing.

is assessed by school staff ratings on a 4-point scale of how well a student can "ask for what he/she needs to do his or her best in class." Locus of control scores are derived from the School Attitude Measure (Wick, 1990), which is the sum of items related to the cause of bad grades, how things turn out at school, whether "a student like me" can get good grades, whether the student has control over grades, and whether the student knows how to be successful in school. Students rated themselves on these self-advocacy skills on a 4-point scale that ranges from "never agree" to "always agree."

Assumption of Responsibilities for Daily Living

- **Assumption of personal responsibilities in the household.** As students 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 students begin to function more independently outside of the home (e.g., by shopping for personal items). Parents were asked how often students 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").

Analysis Methods

A two-pronged analysis approach has been used to address the research questions related to students' outcomes. The first step is to present descriptive findings for the indicators within each outcome domain for students with disabilities as a whole. When possible, outcomes also are compared with those for the general population of students. 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 students 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. The factors included in these multivariate analyses are drawn from the SEELS conceptual framework.

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

- **Weighting of descriptive results.** All of the descriptive statistics presented in this report are weighted estimates of the national population of students

receiving special education in the SEELS age group, as well as in each disability category individually.

- **Standard errors.** For each mean and percentage in this report, the standard error (presented in Appendix B) 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 would, with 95% confidence, lie between 48% and 52% (plus or minus 2 percentage points of 50%), if it had been measured,. Thus, smaller standard errors allow for greater confidence to be placed in the estimate, whereas larger ones require more caution.
- **Small samples.** Although SEELS data are weighted to represent the population, the size of standard errors is influenced heavily by the actual number of students in a given group (e.g., a disability category). Groups with very small samples have comparatively large standard errors. For example, because there are relatively few students with deaf-blindness, estimates for that group have relatively large standard errors. Therefore, readers should recognize the potential imprecision when interpreting results for this group and others with small sample sizes (sample sizes are included in Appendix B).
- **Significant differences.** In discussions of the descriptive statistics, only differences among groups that reach a level of statistical significance of at least .05 are mentioned in the text. Appendix A outlines a method for using standard errors to calculate the significance of differences among groups of interest. Multivariate analyses results indicate statistically significant results with the use of asterisks.

Organization of the Report

Chapter 2 presents the SEELS conceptual framework, which illustrates the factors that are hypothesized to relate to the achievements of students 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 students with disabilities and the individual, household, and school factors that are associated with more positive outcomes in their elementary and middle school years. Appendix A provides details of the SEELS design, sample, measures, and analysis approaches, including definitions of the disability categories. Appendix B includes standard errors and sample sizes for each data table in the report.

The following chapters provide the first national picture of multiple dimensions of the achievements of students with disabilities in their elementary and middle school years and of factors that are associated with those achievements. These findings will be augmented in coming years as SEELS investigates students' transition to secondary school.

2. Factors Expected to Be Associated with the Achievements of Elementary and Middle School Students with Disabilities

By Mary Wagner and Jose Blackorby

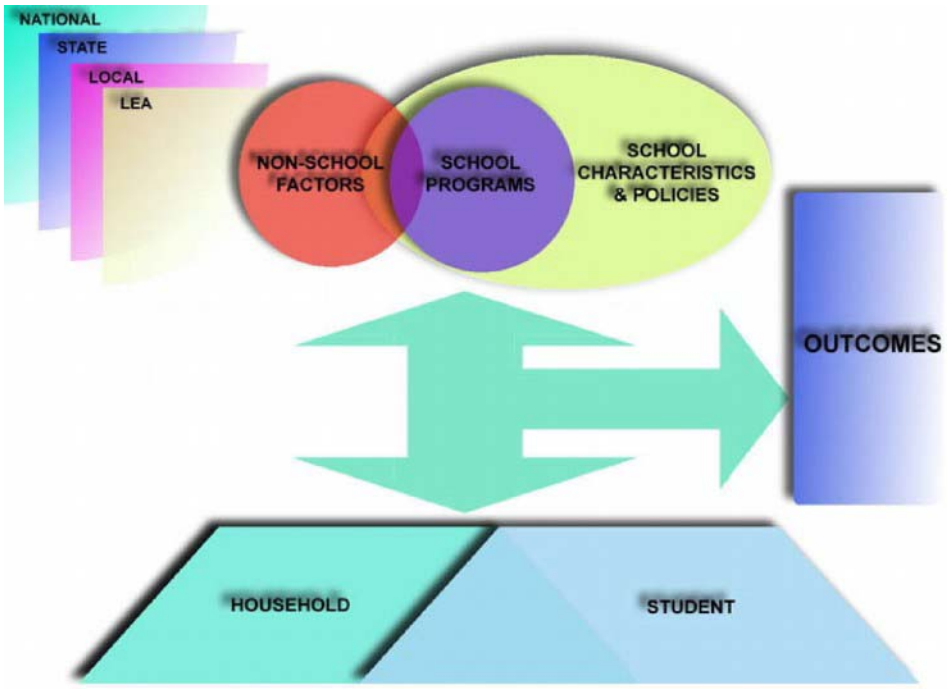
The achievements of students with disabilities during elementary and middle school are the result of a complex interplay of many factors over time. Some are intrinsic to students themselves, some are characteristics of students' family environments, and some involve students' experiences in and outside of school. The importance of a particular factor and the ways factors intertwine may differ for achievements in different domains. This chapter presents the factors that are hypothesized to relate to achievements of students with disabilities in one or more of the outcome domains outlined in Chapter 1.[1]

The SEELS 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 SEELS, the conceptual framework identifies the elements related to the achievements of students with disabilities during elementary and middle school (Exhibit 2-1), as suggested by professional practice and previous research. It suggests that the characteristics of students themselves are fundamental to understanding variations in achievements, including factors related to their disability, functioning, and demographics. However, household and family environment also help shape the achievements of students across domains. From a policy and research perspective, it also is essential to assess the relationships between specific programs of instruction and services that are provided to individual students with disabilities and the variations in their achievements. These factors represent the most promising arenas for intervention to improve results. The factors within these components and the expected relationships to outcomes that led to their inclusion in the analyses are described below.

[1] A similar discussion of factors related to achievements of students with disabilities that focuses on those in secondary school is presented in Wagner, 2003.

Exhibit 2-1
SEELS Conceptual Framework



Individual Student Characteristics

The outcomes identified in Chapter 1 occur through dynamic processes in which students 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. What students bring to these processes are important elements in their success. Three major types of characteristics are hypothesized to relate to the achievements of students with disabilities in multiple domains: disability characteristics, functioning, and demographics.

Disability Characteristics

In considering differences among the achievements of students with disabilities in their elementary and middle school years, it is important to understand those differences for students with various kinds of disability, as identified by:

- **Disability category.** The nature of a particular student's disability can powerfully condition his or her experiences, which may, in fact, be more like the experiences of students who have no labeled disability than like the experiences of students with a different kind of disability. Dichotomous

variables are included in analyses that distinguish students according to the federally defined special education disability categories (Appendix A presents category definitions).[2] The assignment of students to a disability category is based on the primary disability designated by the student's school or district in the 1999-2000 school year. Almost three-fourths of students receiving special education in the SEELS age group are classified as having a learning disability (43%) or a speech impairment (30%). Students with mental retardation and emotional disturbances make up 9% and 6% of students, respectively. Another 5% of students are classified as having other health impairments. The seven remaining disability categories account for about 6% of students with disabilities. The nature of a student's disability is hypothesized to account for much of the variation in achievements, with different disabilities being associated with positive outcomes in different domains (Wagner, Marder, Blackorby, Cameto, Newman, Levine, et al., 2003).

- **Attention deficit disorder/attention deficit hyperactivity disorder (ADD/ADHD).** The behaviors that tend to characterize ADD/ADHD—distractibility, poor impulse control, and excess energy—can have serious negative consequences for the ability of students to succeed academically and socially (Blackorby, Chorost, Garza, & Guzman, 2003; Marder, Wagner, & Sumi, 2003; Reeve, 1994; Zentall, 1993). Thus, having ADD/ADHD is expected to exert its own influence on achievements of students with disabilities, independent of the nature of their primary disability category, especially in the academic achievement domain, in which the ability to focus attention is particularly important. According to parents' reports, 27% of students with disabilities receiving special education services in elementary and middle school have been diagnosed with ADD/ADHD, including 70% of those in the other health impairment category—the category in which students who have ADD/ADHD as a primary disability generally are included (Davila, 1991). However, ADD/ADHD also is a secondary disability for many students in other disability categories, including 65% of those with emotional disturbances and 28% of those with learning disabilities (Wagner & Blackorby, 2002).
- **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, students whose disabilities were identified at an earlier age are expected to have greater challenges to achievement than students who experienced normal

[2] 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 against being in a comparison category. The learning disability category was chosen as the comparison category because it is the largest disability category and, therefore, most closely represents the experiences of students with disabilities as a group.

development for a longer period before the onset of disability (Wagner, Marder, Blackorby, et al., 2003). Parents reported the age at which students first exhibited a physical, learning, or other disability or problem for which they eventually were diagnosed. Although the average age is 4.4 years, approximately one in four students have disabilities that first were recognized when they were infants or toddlers, and another 22% have disabilities or delays that were identified in their preschool years. School entry, at age 5 or 6, was when almost one-quarter of students first had their disabilities identified, whereas 12% did not have their disabilities identified until they were at least 8 years old (Wagner & Blackorby, 2002).

- **Number of types of function influenced by disability.** The number of functional domains affected by disability indicates the breadth of the potential impact of disability on the outcomes students may achieve. To assess the breadth of functional impacts of students' disabilities, parents were asked to report whether students experienced limitations in six areas: general health; vision; hearing; use of arms, hands, legs, and feet; speech production; understanding of speech; and participation in bidirectional communication. Parents of students with disabilities report that their children have problems in an average of between one and two of these areas (Blackorby, Levine, & Wagner 2002).

Functioning

SEELS findings demonstrate the considerable variation in functional abilities across several dimensions among students who share a primary disability category designation (Blackorby, Wagner, Cadwallader, Cameto, Levine, & Marder, 2002). Prior research concerning secondary school students with disabilities also has shown that differences in functional abilities are strongly related to students' outcomes across multiple domains (D'Amico, 1991; Newman, 1991; Wagner, 1991a). Hence, analyses include variables that distinguish the level of functioning of students with disabilities in the areas noted below. Although each of these measures of functioning 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.

- **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; Cameto, Levine, et al., 2003). As described in Chapter 1, SEELS measures self-care through parents' reports of students' abilities to dress and to feed themselves, and the sum of these two items represents the SEELS self-care scale, which ranges from 2 to 8, with a mean of 6.9.
- **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 in most outcome

domains (Wagner, Marder, Blackorby, et al., 2003). As described in Chapter 1, SEELS measures functional cognitive skills through parent reports of students' abilities to read common signs, to tell time on an analog clock, to count change, and to look up telephone numbers. These items sum to represent the functional cognitive skills scale, which ranges from 4 to 16, with a mean of 11.6.

- **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 (Marder, Wagner, & Sumi, 2003). To measure social skills, SEELS employs items from the Social Skills Rating System (SSRS; Gresham & Elliott, 1990a). High social skills are reported for 20% of SEELS students, and 13% are reported to have low overall social skills. The overall social skill scale ranges from 9 to 27, with a mean of 20.4.
- **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. One in three students with disabilities are reported to frequently "keep at a task until it is finished."
- **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 students with disabilities are included in the analysis of absenteeism. Parents report that students with disabilities are about as healthy as students in the general population, with 71% reported to be in excellent or in very good health, and 8% in fair or in poor health (Blackorby, Wagner, Cadwallader, Cameto, Levine, & Marder, 2002).

Demographic Characteristics

The factors noted above suggest that the nature of a student's disability could have strong associations with his or her experiences. However, especially during the rapid developmental changes that occur from elementary to secondary school, other fundamental characteristics also help shape achievements:

- **Age.** Students with disabilities in SEELS were ages 6 through 13 when interview data were collected from parents, and ages 7 through 14 when survey and assessment data were collected from school staff and students. This range represents a wide variety of student development, from entering formal schooling for the first time to preparation for secondary school and adolescence. Students undergo significant changes in physical and psychological development that relate to their ability to function and to succeed. Research demonstrates the influence of age on the academic

performance of secondary school students with disabilities (Blackorby, Chorost, et al., 2003), as well as their social adjustment (Marder, Wagner, & Sumi, 2003) and their independence (Cameto, Levine, et al., 2003).

- **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 students with disabilities regarding aspects of academics (Wagner, 1992), independence (D'Amico, 1991), and social adjustment (Newman, 1991; Cadwallader, Cameto, Blackorby, Giacolone, & Wagner, 2002). Whereas students in the general population are split about evenly between boys and girls, almost two-thirds of students with disabilities in the SEELS age range are boys. In addition, it is clear that gender is intertwined with the nature of students' 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 & Wagner, 2002). Including both gender and disability in multivariate analyses enables identification of their independent relationships to outcomes.
- **Racial/ethnic background.** Research documents the relative disadvantage minority students experience in education and employment domains (National Center for Education Statistics, 2002), as has research on students with disabilities (Blackorby, Chorost, et al., 2003; Cameto, Levine, et al., 2003; D'Amico, 1991; Wagner, 1991a, 1991b). A similar pattern is expected to emerge in the analyses reported in subsequent chapters. Overall, 63% of students with disabilities are white, 19% are African-American, 14% are Hispanic, and 4% 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 & Wagner, 2002). Again, multivariate analyses permit independent identification of the relationships of these factors to outcomes for students with disabilities.

Household Characteristics

Although the variables described above are expected to do much to help illuminate important differences in the experiences of students with disabilities, focusing on these variables alone would mistakenly imply that students' outcomes are determined solely by somewhat immutable characteristics that children bring with them to school and would ignore the important role of the household and family contexts in shaping the experiences of students. The following characteristics of the households of students with disabilities are 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 students as a whole (Duncan & Brooks-Gunn,

1997) and for the achievements of students with disabilities (Newman, 1991; Wagner, 1991a; Wagner, Marder, Blackorby, et al., 2003) and beyond (Wagner, Blackorby, Cameto, & Newman, 1993). A similar pattern is expected for SEELS analyses. One-fourth of students with disabilities live in poverty, a higher rate than in the general population (Wagner, Marder, & Cardoso, 2002). However, the incomes of families of students 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 often is a characteristic of the households of children and students of color, including both household income and the racial/ethnic background of students with disabilities in analyses helps disentangle their interrelationships.

- **Family support for education.** Parent support for learning is an important contributor to students' success in school for the general student population (Epstein, 1987, 1997; Henderson & Berla, 1994; Thorkildsen & Scott 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). Positive associations also have been found for secondary school students with disabilities (Wagner, Marder, Blackorby, et al., 2003). Similar associations are expected for students 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 students with homework and talking with students about school, and a dichotomous variable indicating whether the family provides a computer at home that the student uses for educational purposes; summing these items produces a scale ranging from 0 to 9, with a mean of 7.9. Family involvement at school is assessed with a 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: "attended a general school meeting, for example back-to-school night or the meeting of a parent-teacher organization"; attended a school or class event, such as a play, sports event, or science fair; or "volunteered at school, for example chaperoning a field trip or serving on a committee." The scale ranges from 0 to 12, with a mean of 4.3.
- **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 & Scott Stein, 1998). Similar relationships have been found for students with disabilities (Wagner, Blackorby, Cameto, & Newman, 1993; Wagner, Marder, Blackorby, et al., 2003) and were expected to emerge in SEELS analyses. Analyses reported in this chapter include responses from parents regarding their expectations that their children with disabilities will "attend school after high school," and "live away from home on his or her own

without supervision." Expectations for students are generally high. Overall, 77% of parents expect students "definitely" or "probably" to attend postsecondary school, and 87% expect their children to live independently.

School Programs and Experiences

School programs, support services, and other experiences can and do help shape student's achievements, particularly in the domains of academic engagement and performance. Some aspects of students' school programs are 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 are expected to enhance the academic engagement and performance of students with disabilities, as well as their social integration. 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. Factors include the following:

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 the number of minutes students with disabilities spent in general education classes, special education resource rooms, self-contained special education classes, and individual or homebound settings, 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 with academic performance. For example, exposure to the more challenging content in general education classes, relative to many special education classes, is expected to help students with disabilities acquire the skills appropriate to their grade level (Blackorby, Chorost, et al., 2003), and research also has demonstrated the relationship of general education participation to lower absenteeism (Newman, Davies, & Marder, 2003). On the other hand, the more challenging content and, often, different grading standards in general education classes may be reflected in poorer grades for students with disabilities relative to their peers in special education classrooms. In fact, research on secondary school students with disabilities has demonstrated that spending a greater proportion of the school day in general education classes was related to lower overall grades and higher rates

of course failure for students with disabilities (Blackorby, Chorost, et al., 2003; Wagner, 1991a). Relationships also are expected in the social adjustment domain (Marder, Wagner, & Sumi, 2003).

- **Average class size.** Both the content of courses taken by students with disabilities and the context within which those courses are taken potentially influence their outcomes. One aspect of interest is class size. In the general education arena, many states, as well as the federal government, have launched initiatives to reduce class size 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). SEELS asked school staff to report the number of students in each student's primary language arts class. Across settings, class size averages 17.7 students.

Services, Accommodations, and Supports

It is important to understand the relationships between the outcomes of students 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 the analyses. However, interpreting the relationships that result is 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 SEELS will provide 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; Longwill & Kleinert, 1998), 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-half of students with disabilities were reported to receive help from a tutor.
- **Receiving social adjustment support services.** The Individuals with Disabilities Education Act Amendments of 1997 (IDEA '97) requires the

teams that plan a student's individual education program (IEP) to consider, if appropriate, strategies to address behavior that impedes a student's learning or that of others [34CFR300.346(a)2(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 students who receive them include: mental health services (9%), social work services (6%), a behavior management plan (19%), and services from a behavioral interventionist (7%). In some analyses, the sum of these services and supports is included; it ranges from 0 to 4, with a mean of .4.

- **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 elementary and middle school students with disabilities (Bielinski, 2001; Thurlow, Hurley, Spicuzza, & El Sawaf, 1996). Thus, an indicator of receipt of such accommodations is included in SEELS analyses of academic performance. School staff indicated whether students receive the following: more time to take tests, tests that were read aloud, modified tests, alternative assessments, modified grading standards, slower-paced instruction, more time to complete assignments, shorter or different assignments, or help with learning strategies or study assistance. A scale of the extensiveness of such support was constructed by summing the number 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 students receive 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 aides (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 6, with a mean of .6.
- **Curriculum modifications.** An additional mechanism available to educators in their efforts to support students with disabilities is to modify the curriculum and associated materials to suit student needs better (Warger & Pugach, 1996). School staff reported whether the students' primary language arts curriculum materials are grade-level materials without modification, with some modification, or with substantial modification, or are specialized materials. A scale of the level of curriculum material modification was constructed by summing these two items. The scale ranges from 0 to 8, with a mean of 3.7.

- **Instructional grouping.** With larger and increasingly diverse classrooms, many instructional designers seek to alter the size of the instructional group to meet the range of needs found in typical classrooms better. Variations in instructional group size affect many aspects of the instructional environment, including content delivery, student interaction, individual attention and individualization, and assessment. The use of small groups has been shown to influence student performance positively, including the performance of students with disabilities (Elbaum, Vaughn, Hughes, & Moody, 1999; Fuchs, Fuchs, Kazdan, & Allen, 1999; Slavin, 1996; Vaughn, Bos, & Schumm, 1997). These analyses include the frequency of whole class, small group, individual instruction from the teacher, and individual instruction from another adult in the students' primary language arts classroom.
- **General instructional activities.** The activities that occur in the context of instruction represent the factors that most directly touch the daily experiences of students and could be considered likely to more directly affect student outcomes (Dreeben & Barr, 1988a, 1988b; Gersten, 1998; Gersten & Dimino, 1989; Pressley, Roehrig, Bogner, Raphael, & Dolezal, 2002; National Center for Education Statistics, 1999). It is expected that students who more actively participate in classroom activities will have better academic outcomes. In the context of students' primary language arts class, school staff rated the frequency that students respond to questions, participate in class discussions, work independently, work with a peer or a group, work on a project or presentation, or present in front of the class. A scale representing the overall level of participation in instructional activities was constructed by summing these items. The scale ranges from 0 to 28, with a mean of 22.1.
- **Literature-oriented activities.** The ultimate purpose of language arts instruction is to develop students' skills so that they can access a variety of types of literary and expository content, and can learn to express themselves in writing (Harris, Graham, & Deshler, 1998; Lyon, 1998; O'Connor, 1999; Warger & Pugach, 1996). It is expected that students who frequently engaged in such activities will have more positive outcomes, particularly in regard to measures related to reading. In the context of students' primary language arts class, school staff rated the frequency that students complete writing assignments, read aloud or silently, and read literature or informational materials. A scale representing the overall level of participation in literature-oriented activities was constructed by summing these items. The scale ranges from 0 to 12, with a mean of 9.5.
- **Skill-building activities.** For most students, elementary school instruction includes a direct focus on acquiring skills necessary for fluent reading. These skills may be especially important for students with disabilities, who frequently are referred to special education because of difficulties in reading (Fuchs et al., 2002; Grossen & Carnine, 1993; Lyon, 1998; O'Connor et al., 1992). It is expected that students who frequently engaged in skill-building activities will have more positive outcomes, particularly in regard to

measures related to reading. School staff rated the frequency that language arts instruction focuses on phonemic skills, vocabulary building, or sight word reading. A scale representing the overall level of participation in skill-building activities was constructed by summing these items. The scale ranges from 0 to 12, with a mean of 9.8.

- **Teacher education.** The need for highly qualified teachers is central to NCLB, and one aspect of teachers' qualifications is the level of education they attain (Serim, 2002). Teachers who are certified in the content they teach and who have higher levels of education are often considered to be able to produce improved outcomes for students (Allinder, 1995; Darling-Hammond, 2000). In these analyses, the level of educational attainment of primary language arts teachers—ranging from B.A. to master's degree—is included as an independent variable.

Other School Experiences

In addition to the courses, settings, and services and supports that characterize the school programs of students with disabilities, other current and past experiences of schooling are expected to relate to their 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 both frequent behavioral problems in general education (Demie, 2002; Rumberger, 2002; Simpson & Fowler, 1994; Wood, Halfon, Scarlata, Newacheck, & Nessim, 1993), and social adjustment problems among students with disabilities (Marder, Wagner, & Sumi, 2003). 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 the 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. Parents were asked to report students' overall grades on a 9-point scale (e.g., mostly As, mostly As and Bs, mostly Bs). For students whose parents were not interviewed, teachers' reports of the grades given students in their language arts classes were used (recorded on the same 9-point scale). If students did not receive these kinds of letter grades, parents and teachers were asked to report whether students' work is "excellent,"

"good," "fair," or "poor," and those responses were converted to letter grades (described in Appendix A).

- **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 school engagement, academic performance, 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 during their first exposure at a given grade level. Although public policy is shifting to disapproval of 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 retained students dropping out of school (Roderick, Nagaoka, Bacon, & Easton, 2000) and poor social adjustment and employment outcomes after high school (Jimerson, 1999). SEELS analyses include a measure of parents' reports of whether students 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 students with disabilities, their households, and their school programs and experiences with outcomes in the school engagement, academic performance, social adjustment, and independence domains.

3. The School Engagement of Elementary and Middle School Students with Disabilities

By Lynn Newman and Elizabeth Davies

Policymakers, educators, and researchers agree that students who participate actively in and enjoy their school experience are more likely to experience educational success (Herman & Tucker, 2000; Hudley et al., 2002; Newmann, 1992; Singh, Granville, & Dika, 2002; Sirin & Jackson, 2001). This chapter examines the engagement in or "connection" to the school experience of elementary and middle 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 student demographics, 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.

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 classroom academic or behavioral expectations may experience repeated embarrassment or failure, which in turn may lead to diminished satisfaction and motivation for 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 students with disabilities than for other students, resulting in the students receiving fewer opportunities and less encouragement to participate in stimulating or challenging classroom activities (Goodenow, 1992; Grossman, 2002). Moreover, some students have disabilities that may make it difficult for them to sustain attention to school tasks.

Fortunately, unlike some other student characteristics (e.g., demographics, disability category), a student's level of engagement at school can be modified by external influences, such as teachers' behaviors, school climate, and attitudes of parents and peers (Finn, 1993; King, Vidourek, Davis, & McClellan, 2002; Marks, 2000; Naffziger, Steele, & Varner, 1998). Students who are made to feel welcome at school, 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. Research suggests that engagement at school is a multidimensional construct, having emotional or psychological as well as behavioral components (Finn, 1993; Sirin & Jackson, 2001). This chapter examines both the psychological and the behavioral dimensions of school engagement for students with disabilities.

The psychological or emotional dimension of engagement at school reflects the extent to which a student identifies with the school environment (Finn, 1993). Students who have positive feelings about school are more likely than other students to attend school and participate fully in their educational experience. Students' motivations, or their overall attitudes toward coming to school each day and their dispositions while there, are other psychological indicators of their engagement at school.

At least in part reflecting their feelings and motivations 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). School attendance is the most basic indicator of engagement. Missing many days of school means students miss coursework that often is difficult to make up. Students who are absent frequently also lose access to teachers and peers who can promote positive attitudes about and approaches to learning. 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). Finally, 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.

The analyses below focus on four indicators of engagement at school:[1]

- Feelings about school.
- Motivation for schooling.
- School attendance.
- Classroom behaviors.

School engagement is described in regard to these dimensions for students with disabilities as a group and for those who differ in their primary disability category. Then, three indicators receive more in-depth analysis—motivation for school, absenteeism, and classroom engagement behaviors.

[1] Similar analyses were conducted for secondary school students with disabilities and are reported in Newman, Davies, & Marder, 2003.

Dimensions of School Engagement

The Psychological Dimension of School Engagement

The psychological dimension of school engagement is measured by students' feelings about school and their motivation for schooling. To estimate students with disabilities' feelings about school, parents were asked to indicate their level of agreement with the statement, "[Student's name] enjoys school." To examine student motivation, SEELS administered the Motivation for Schooling subtest of the School Attitude Measure (Wick, 1990). Students responded to seven questions related to looking forward to school, enjoying school, and the importance of school for later success. The motivation for schooling scale ranges from 7 (all responses given the least positive rating) to 28 (all responses given the most positive rating). Scale scores are grouped as less motivated (scores of 7 to 13), moderately motivated (scores of 14 to 20), and highly motivated (scores of 21 or 28).

- Students with disabilities demonstrate a range of levels of motivation for schooling (Exhibit 3-1). About 4 in 10 (42%) are characterized as being highly motivated with regard to their schooling; nearly one-fourth (23%) are characterized as having low motivation.
- Parents of a majority of students with disabilities (86%) agree or strongly agree that their children enjoy school (Exhibit 3-1), but only about half (52%) of students themselves report that they usually or always are happy at school (Exhibit 3-2).

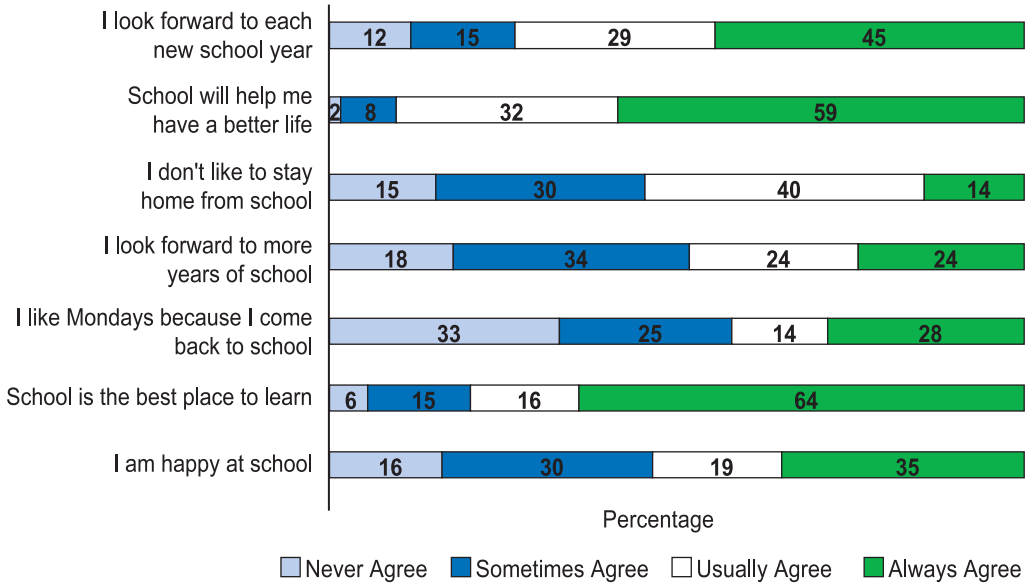
Exhibit 3-1
Attitudes Toward School of Students with Disabilities

	Percentage
Have parents who agree that their child enjoys school:[a]	
Strongly agree	35.2
Agree	50.9
Disagree/strongly disagree	13.9
Receive scores on motivation toward school that are:[b]	
High (scores of 13 to 16)	41.5
Moderate (scores of 8 to 12)	35.1
Low (scores of 4 to 7)	23.4

[a] Source: Wave 1 parent interviews.
[b] Source: Wave 1 direct assessment.
Standard errors and sample sizes are in Appendix B.

- Fewer than one-half of students with disabilities (42%) usually or sometimes agree that they like Mondays because they come back to school. A higher

Exhibit 3-2
Motivation for Schooling of Students with Disabilities



Source: Wave 1 direct assessment.
Standard errors and sample sizes are in Appendix B.

percentage of students report that they do not like to stay home from school (54% usually or always agree with the statement).

- Although these findings suggest that some students with disabilities do not always want to be at school, students appear to appreciate the benefits of school attendance. Most students with disabilities usually or always agree that school will help them have a better life (91%) and that school is the best place to learn (80%).

The Behavioral Dimension of School Engagement

The behavioral dimension of school engagement is measured by the number of days students are absent from school in a 1-month period (Exhibit 3-3) and by their behaviors when in the classroom (Exhibit 3-4).

- On average, students with disabilities miss 1.5 days of school in 1 month, or about 15 days per school year. In a 1-month period, 5% of students with disabilities miss more than 1 week of classes.

Exhibit 3-3
School Absenteeism of Students with Disabilities

Mean number of days absent in 1 month	1.5
Percentage absent 6 or more days in 1 month	4.7

Source: Wave 1 school program questionnaire.
Standard errors and sample sizes are in Appendix B.

To measure students' classroom behavior, language arts teachers were asked to report how often students do the following:

- Take part in group discussions
- Complete homework on time
- Follow directions
- Keep at a task until finished, even when it takes a long time
- Work independently, even with difficult tasks.

For four items, teachers responded on a 3-point scale and for one item on a 4-point scale, with both scales ranging from "rarely" to "almost always." To examine overall classroom behavior in each type of setting, a scale was created by summing the ratings for the five behaviors. The scale ranges from 5 (all behaviors given the least positive rating) to 16 (all behaviors given the most positive rating). Scale scores are grouped as less engaged (scores of 5 to 8), moderately engaged (scores of 9 to 14), and highly engaged (scores of 15 or 16). Classroom behavior findings are presented separately for students attending a general education language arts class (55% of students with disabilities) and a special education language arts class (45% of students with disabilities) (Exhibit 3-4).

Exhibit 3-4
Classroom Engagement Scale Scores of Students with Disabilities in Language Arts, by Class Setting

	General Education Language Arts Class	Special Education Language Arts Class
Percentage less engaged (scores of 5 to 7)	2.8	4.2
Percentage highly engaged (scores of 13 to 16)	52.4	50.5
Mean score	12.7	12.0

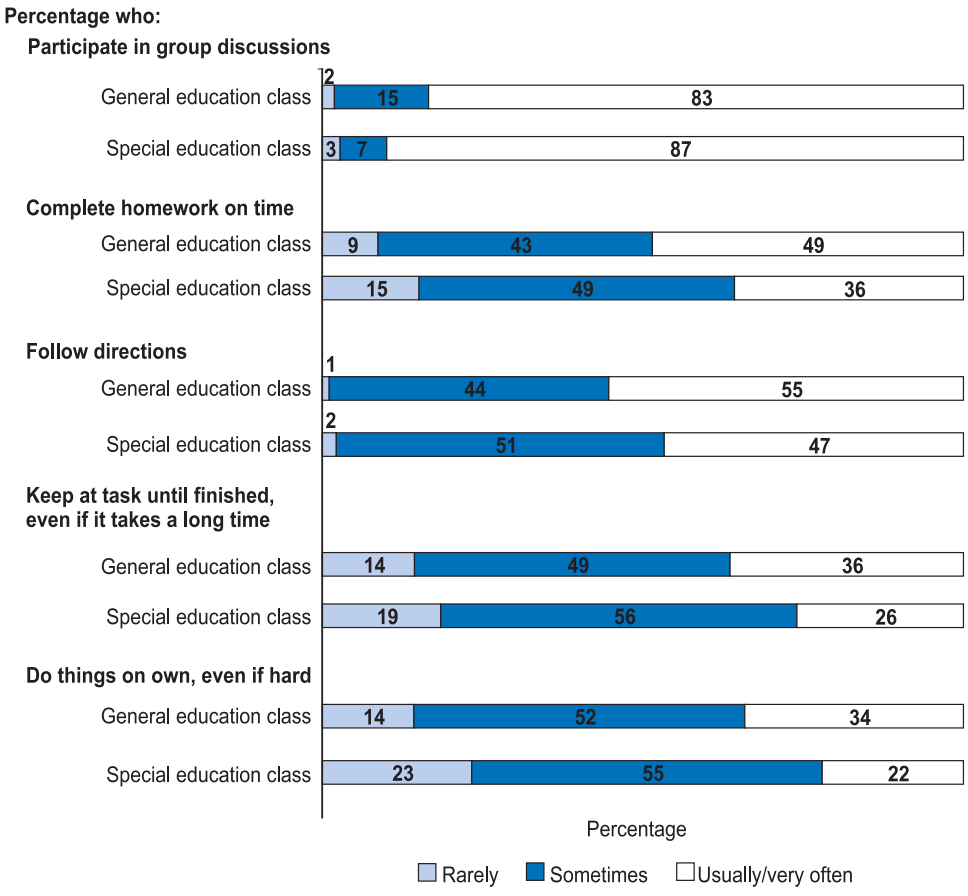
Source: Wave 1 teacher questionnaire.
The category "moderately engaged" is omitted from the exhibit.
Standard errors and sample sizes are in Appendix B.

- Students with disabilities in a general education language arts classroom are somewhat more likely to be considered highly engaged than are students in a special education language arts classroom. The mean classroom engagement scale score for students in a general education class is 12.7 out of a possible 16; for students in a special education class, this score is 12.
- The higher engagement of students with disabilities in general education classes is illustrated by specific student behaviors in the classroom. For example, higher percentages of students in general education than in special education language arts classes "usually" or "very often" complete homework on time, follow directions, keep at tasks until finished, and work on their own, even if the work is hard (Exhibit 3-5).
- The classroom behavior in which students with disabilities seem to be the most engaged is participating in group discussions. Most students with disabilities "usually" or "very often" participate in group discussions, regardless of class setting (83% of students in general education language arts classes and 87% of students in special education class).
- Fewer than half of students with disabilities "usually" or "very often" complete their homework on time; students in general education language arts classes are more likely to do so than are students in special education classes (49% vs. 36%).
- Teachers also reported on the propensity of students with disabilities to keep at a task until it is finished, even if it takes a long time. Overall, 36% of students in general education classrooms "usually" or "very often" persist with tasks, whereas fewer students in special education classes persist (26%). Teachers report that 19% of students with disabilities "rarely" keep at a task

until finished in special education classes, compared with 14% of students with disabilities in general education classes.

- According to teachers, most students with disabilities do things on their own at least some of the time, even when they find tasks to be difficult. However, this independence is more common among students with disabilities in general education than in special education classes. Of students in general education classes, 34% are likely to do things on their own "usually" or "very often," compared with 22% of their peers in special education classes. Similarly, nearly one-fourth of students in special education classes (23%) "rarely" exhibit this kind of engagement, which is the highest such rating among the behaviors examined.

Exhibit 3-5
Classroom Engagement Behaviors of Students with Disabilities, by Class Setting



Source: Wave 1 teacher questionnaire.
Standard errors and sample sizes are in Appendix B.

Disability Differences in School Engagement

- Overall, students with hearing, visual, or orthopedic impairments are among the most engaged students with disabilities (Exhibit 3-6). More than 45% of students in these disability categories have parents who strongly agree that their children enjoy school, and similar percentages received high motivation scores. Students with these disabilities also are among those most likely to be rated as highly engaged in the classroom, particularly in general education classes. Students with speech impairments, mental retardation, or multiple disabilities also tend to be more motivated toward schooling than students with other types of disabilities; those with speech impairments also have high classroom engagement behaviors in general education classes.
- Students with emotional disturbances or other health impairments are among the least engaged students with disabilities in regard to both the psychological and behavioral dimensions of school engagement. For example, 28% of students with emotional disturbances have parents who disagree or strongly disagree that the child enjoys school, the highest percentage among all disability categories. Students with emotional disturbances or other health impairments also are among the least likely to be rated as being highly motivated and as having classroom behaviors that demonstrate high engagement. Relatively few students with these disabilities have high classroom behavior engagement scores in either classroom setting.
- In terms of the behavioral dimension of school engagement, there is greater variation across disability categories in classroom behavior than in rates of absenteeism. Absenteeism does not vary widely by disability category, averaging 1 or 2 days. The students who are most likely to be absent at least 6 days in 1 month are those with mental retardation, traumatic brain injuries, or multiple disabilities (7% to 9%). The percentages of students who are considered highly engaged in terms of their classroom behaviors range considerably and differ by classroom setting.
- Students in many disability categories are more likely to be highly engaged when they are in general education language arts classes than when they are in special education classes. Students with mental retardation show the opposite pattern; they are more likely to be highly engaged when they are in special education than in general education classes. Students with learning disabilities, emotional disturbances, and other health impairments are equally likely to be highly engaged in the two settings.
- Classroom setting appears to be especially important for the engagement of students with certain disabilities. For example, students with visual impairments are twice as likely to have high classroom engagement scores when they are in a general education class as when they are in a special education class (63% versus 31%). In addition, 18% of students with visual impairments who are in a special education class have low classroom

engagement scores, compared with only 1% of those who are in a general education class. Students with autism also are much more likely to have low classroom engagement scores when in a special education class, rather than a general education class.

Exhibit 3-6
Students' School Engagement, by Disability Category

	Learning Disability	Speech/ Language Impair-ment	Mental Retar-dation	Emotional Disturb-ance	Hearing Impair-ment	Visual Impair-ment	Ortho-pedic Impair-ment	Other Health Impair-ment	Autism	Traumatic Brain Injury	Multiple Disabili-ties
Attitudes toward school											
Percentage whose parents agree that their child enjoys school [a]											
Strongly agree	29.6	41.4	40.2	24.1	45.8	48.6	46.3	32.9	39.5	31.7	44.2
Disagree/strongly disagree	16.0	9.8	10.9	27.8	10.1	8.0	6.3	20.4	12.5	16.6	7.9
Percentage with low motivation scale scores (7 to 13) [b]	14.6	5.3	8.3	15.3	9.6	8.6	10.7	17.7	9.4	22.6	6.8
Percentage with high motivation scale scores (21 to 28) [b]	45.4	51.9	58.0	38.2	47.7	47.4	49.3	37.1	42.5	40.0	62.7
Absenteeism [c]											
Average days absent in 1 month	1.6	1.0	1.9	1.9	1.3	1.4	1.6	1.6	1.1	1.8	2.1
Percentage absent 6 or more days in 1 month	5.6	1.7	8.6	7.1	4.4	5.2	5.9	6.2	4.7	7.3	7.6
Classroom engagement behaviors [d]											
Percentage with high classroom engagement scale scores (15 or 16) in:											
General education class	43.7	63.4	24.3	27.5	59.7	63.0	59.2	35.6	29.9	49.5	43.1
Special education class	49.3	48.7	42.4	27.1	48.0	31.0	43.2	33.2	19.8	37.9	34.3
Percentage with low classroom engagement scale scores (4 to 8) in:											
General education class	3.0	2.4	6.4	6.0	0.0	1.1	0.6	2.2	2.7	2.5	8.0
Special education class	1.4	6.2	6.5	5.3	3.1	18.1	7.4	3.4	12.2	2.0	13.5

[a] Source: Wave 1 parent interview. The category "agree" is omitted from the exhibit.
[b] Source: Wave 1 direct assessment.
[c] Source: Wave 1 school program questionnaire.
[d] Source: Wave 1 teacher questionnaire. The category "moderately engaged" is omitted from the exhibit.
Standard errors and sample sizes are in Appendix B.

Factors Associated with School Engagement

A series of multivariate regression analyses was performed to identify the independent relationships of three measures of school engagement—absenteeism, classroom engagement scale scores (in general and in special education language

arts classes), and motivation for schooling—with characteristics of students with disabilities, their households, and their school programs and experiences.

Individual Characteristics

Individual characteristics include those associated with the disabilities of students, their functioning, and their demographics (Exhibit 3-7).

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 a disability category, with the exceptions that rates of absenteeism are 4 to 5 days greater annually for students with serious emotional disturbances, visual impairments, or other health impairments than for the comparison condition, students with learning disabilities.
- Although the bivariate analyses demonstrate considerable range in classroom engagement scores in both general and special education settings, multivariate analyses show no differences in classroom engagement ratings in general education language arts settings related to disability category. In contrast, in special education language arts, students with autism or multiple disabilities are less likely to be engaged in their classes, receiving lower special education classroom engagement scores than their peers with learning disabilities.
- Disability differences are apparent in students' motivation for schooling in these multivariate analyses. Controlling for other factors, these analyses show that students with speech impairments, serious emotional disturbances, or orthopedic impairments receive scale scores that signal lower motivation for schooling than do their peers with learning disabilities.
- In both general and special education language arts classes, students reported to have ADD/ADHD receive lower classroom engagement ratings than peers who do not have ADD/ADHD, independent of other differences between them.

Exhibit 3-7
Differences in School Engagement Associated with Individual Characteristics of Students with Disabilities

	Estimated Difference In: [a]				
	Average Number of Days Absent per Year	General Education Classroom Behavior Scale Score	Special Education Classroom Behavior Scale Score	Motivation for Schooling Scale Score	Comparison Categories
Disability characteristics					
Students classified with:					
Speech impairment				**-1.5**	vs. learning disability[b]
Mental retardation					vs. learning disability
Emotional disturbance	**4.9**			**-1.1**	vs. learning disability
Hearing impairment					vs. learning disability
Visual impairment	**4.6**				vs. learning disability
Orthopedic impairment				**-1.1**	vs. learning disability
Other health impairment	**4.4**				vs. learning disability
Autism			**-.6****		vs. learning disability
Traumatic brain injury					vs. learning disability
Multiple disabilities			**-.4**		vs. learning disability
Parents report ADD/ADHD[c]		**-.3**	**-.3**		Yes vs. no
Age at identification of disability		**-.3**		**-.9*****	8-years vs. 4-years
Number of problem domains				**.5**	Three vs. one
Functioning					
General health status	**-4.3**				Excellent vs. poor
Self-care skills	**-4.5*****		**.6*****		High vs. low
Functional cognitive skills					High vs. low
Social skills	**4.0**				High vs. low
Persistence		**.6*****	**.4*****		Very often keeps at tasks vs. rarely does so
Demographics					
Age				**-2.1*****	12 vs. 9
Gender	**-2.2**		**-.4*****	**-.8**	Male vs. female
Race/ethnicity					
African-American				**1.3*****	vs. white
Hispanic				**1.3**	vs. white
Other					vs. white
Uses primarily language other than English at home					Yes vs. no

[a]Statistics in this exhibit are calculated from models that include all individual characteristics shown in this exhibit as well as household characteristics (results shown in Exhibit 3-8) and school programs and experiences (results shown in Exhibit 3-9). All statistics in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.
[b]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.
[c]ADD/ADHD is included to determine its relationships as a primary or secondary disability to academic performance, independent of youth's primary disability category.
Exhibit reads: Students with emotional disturbances miss an average of 4.9 more days in a year than students with learning disabilities, other factors being equal. The special education classroom engagement scores of students with high self-care skills are .6 points higher than the scores of students with low self-care skills. Other analysts could choose different comparisons (e.g., medium and low self-care skills), which would result in a different estimate but would have no effect on its statistical significance.

- Students who were older when they were first identified as having a disability have lower classroom engagement scores in general education language arts classes, as well as lower motivation for schooling scores, controlling for other factors.
- Students whose disabilities affect a greater number of functional domains (e.g., three vs. one domain, including general health, vision, hearing, use of appendages, speech production, speech comprehension, and participation in bidirectional communication) have higher motivation for schooling scores than students whose disabilities have less widespread functional limitations.

Functioning

- Although voluntary absenteeism from school is often considered an indicator of alienation from school (e.g., Finn, 1989; Hudley, 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 nearly 5 fewer days of school in a year than those whose health is rated as "poor."
- Students' self-care skills are related to their school engagement. Those with higher self-care skills scores miss fewer days of school and receive higher behavior score ratings in their special education language arts classes.
- Functional cognitive skills are not related to any measure of school engagement, controlling for other factors.
- Having stronger social skills is related to higher rates of absenteeism, although it does not appear to be related to other types of engagement when other differences among students are held constant.
- Persistence is related to classroom engagement in both class settings. This relationship between keeping focused on tasks and classroom engagement is expected in that two components of the classroom engagement scale are completing homework on time and completing a task even when it takes a long time—two activities that reflect persistence.

Demographic Characteristics

- Age differences among 9- through 12-year-olds are unrelated to their absenteeism or behavior, but older students with disabilities have lower scores in motivation for schooling than their younger peers.
- Absenteeism, classroom engagement, and motivation for schooling are related to gender, though not in a consistent direction. Independent of differences in disability and other factors, boys miss 2 fewer days of school per year than do girls, but girls receive higher classroom engagement scale scores than boys in special education language arts classes and have higher motivation for schooling scores.

- Controlling for other factors, racial/ethnic background is related only to motivation for schooling. African-American and Hispanic students receive higher motivation ratings than do white students, other factors being equal.

Household Characteristics

- Household income is related to differences in absenteeism and classroom engagement in general education, with students from wealthier families missing less school and receiving higher classroom behavior scores in general education language arts classes than their lower-income peers (Exhibit 3-8). No differences are found in classroom engagement scores in special education language arts classes or in motivation for schooling related to household income when other factors are taken into account.

Exhibit 3-8
Differences in School Engagement Associated with Household Characteristics of Students with Disabilities

	Estimated Difference In:				
	Average Number of Days Absent per Year	General Education Classroom Behavior Scale Score	Special Education Classroom Behavior Scale Score	Motivation for Schooling Scale Score	Comparison Categories
Household income	**-1.8**	**.2**			$55,000 to 60,000 vs. $20,000 to 24,000 (12 vs. 5)
Family involvement at home	**-2.6**	**-.2*** **			High vs. low (8 vs. 4)
Family involvement at school					High vs. low (6 vs. 1)
Family expectations for postsecondary attendance					Definitely will vs. probably won't (4 vs. 2)

[a]Statistics in this exhibit are calculated from models that include all household characteristics shown in this exhibit as well as individual characteristics (results shown in Exhibit 3-7) and school program and experience factors (results shown in Exhibit 3-9). All statistics in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.

Exhibit reads: Students from households with incomes of $55,000 to $60,000 miss an average of 1.8 fewer days in a year than students from households with incomes of $20,000 to $24,000, other factors being equal. The classroom engagement scores of students in general education classes whose families have high involvement in their education at home are .2 points lower than the scores of students with low family involvement at home. Other analysts could choose different comparisons (e.g. $30,000 to $34,000 and $40,000 to $44,000 in household income), which would result in a different estimate, but would have no effect on its statistical significance.

- Family involvement at home is related both to absenteeism and to classroom engagement in general education settings, but in opposite directions. Students whose families are more highly involved in their children's education at home miss 3 fewer days of school annually, but they also receive lower class behavior engagement scores than do those whose families are less involved at home.
- Parents expecting their children with disabilities to continue their education past high school is not related to any of the engagement measures.

School Programs and Experiences

School Program Factors

Several aspects of the school programs of students with disabilities are related to their school engagement (Exhibit 3-9).

- Holding constant individual and household differences among students, greater inclusion in general education classes is related to lower absenteeism for students with disabilities. Conversely, students whose course taking emphasizes special education classes miss more school. The extent of participation in general education classes is unrelated to students' engagement behavior or motivation for school.
- Class size is related to engagement only in special education settings where larger classes are associated with lower engagement ratings.
- Several kinds of accommodations and supports provided to students with disabilities are related to their classroom engagement. Controlling for other factors, students who receive social adjustment supports also receive lower engagement ratings in both settings. Also, students who receive more modifications for tests, instructions, and assignments receive lower engagement scale scores in general education language arts classes. Although these kinds of academic and social supports could be expected to help students with disabilities feel more engaged and successful in these classes, it also is reasonable to believe 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 such supports, a negative relationship between receiving supports and school engagement persists.

Exhibit 3-9
Differences in School Engagement Associated with School Programs and Experiences of Students with Disabilities

	Estimated Difference In:				
	Average Number of Days Absent per Year	General Education Classroom Behavior Scale Score	Special Education Classroom Behavior Scale Score	Motivation for Schooling Scale Score	Comparison Categories
School Programs					
Percentage of time spent in general education classes	**-3.8*** **				75% vs. 25%
Class size			**-.4*** **		22 students vs. 10
Number of social adjustment supports provided		**-.5*** **	**-.7*** **		Two vs. none
Number of modifications to tests		**-.4*** **			Seven vs. one
Modifications to curriculum materials			**-.2**		No modification vs. substantial modification
Degree of whole class instruction			**.3**		Frequent vs. rare
Degree of small group instruction			**.9*** **	**1.5*** **	Frequent vs. rare
Degree of individual instruction from teacher		**-.7*** **			Frequent vs. rare
Degree of individual instruction from another adult				**.4*** **	Frequent vs. rare
Literature activities		**2.4*** **	**1.2*** **		Frequent vs. rare
Skills-based activities		**1.2*** **	**1.3*** **		Frequent vs. rare
Other School Experiences					
Grades		**1.3*** **	**.9*** **		Mostly As and Bs vs. Mostly Ds and Fs
Absenteeism		**-.4**			5 days vs. 0 days
School mobility		**-.4*** **		**-.9*** **	Three school changes vs. none
Retention at grade level					Yes vs. no
Membership in school groups		**NA**	**NA**	**NA**	Yes vs. no

[a]Statistics in this exhibit are calculated from models that included all school program factors shown in this exhibit, as well as individual and household characteristics (results shown in Exhibits 3-7 and 3-8). All statistics in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.

Exhibit reads: Students who take an average of 75% of their courses in general education classes miss an average of 3.8 fewer days of school in a year than students who take 25% of their classes there, other factors being equal. The classroom engagement scores of students in general education classes who frequently engage in literature-based activities are 2.4 points higher than the scores of students with a low frequency of such activities. Other analysts could choose different comparisons (e.g., 40% and 60% time spent in general education classes), which would result in a different estimate, but would have no effect on its statistical significance.

- Students who receive an unmodified curriculum have higher classroom engagement scores in special education language arts than do peers who receive substantial modifications, controlling for other factors.
- Higher levels of participation in several classroom groupings approaches also are related to measures of engagement. Frequent participation in both whole class and small group instruction are related to higher classroom engagement scores in special education language arts classes. In addition, frequent participation in small group instruction is related to higher motivation for schooling scores. On the other hand, students who require and receive greater individual instruction from a teacher have lower classroom behavior ratings in general education, whereas those receiving more instruction from another adult have higher motivation for schooling scores.
- More frequent participation in both literature-oriented activities (e.g., literature, poetry, writing), as well as skill-building activities (e.g., phonics, vocabulary), is related to higher classroom engagement ratings in both general and special education classes.

Other School Experiences

There are several relationships between the variety of current and past experiences that students with disabilities have with school and their current school engagement.

- Students with higher grades receive higher classroom engagement scores than peers with lower grades, controlling for other factors.
- Higher levels of absenteeism are related to lower classroom engagement in general education language arts.
- Changing schools frequently, for reasons other than changing grade levels, appears to result in weaker social bonds with the school; students who have changed schools three times have lower behavior ratings in general education classes than those who have made no changes, other things being equal. Students who change schools frequently also are less motivated toward their schooling.
- Having been held back a year in school does not appear to have a negative relationship with school engagement, nor does participation in extracurricular school activities, other aspects of students and their experiences held constant.

How Much is Explained?

- The four multivariate analyses of measures of school engagement explain a statistically significant portion of the variation in the measures analyzed, although the factors analyzed explain a larger percentage of variation in classroom behaviors than in absenteeism. Analyses of classroom behavior produce r^2s (i.e., the proportion of variance in the dependent measure explained by the independent variables) of .37 and .42 for behavior in special

and general education classes, respectively, and .18 for motivation for schooling. In contrast, the r^2 is .06 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 do household characteristics and support for education.

Summary

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

The majority of students with disabilities enjoy school, according to their parents, and four out of ten are highly motivated toward schooling according to their own reports. Few are excessively absent from school, and poor health is a common reason for it. Language arts teachers give high ratings on classroom engagement behaviors to more than half of their elementary and middle school students with disabilities.

Student engagement at school is related to characteristics of students, as well as to characteristics of their school programs. In bivariate analyses, there are substantial differences across disability categories in students' school engagement, although many of these differences are moderated in multivariate analyses when other differences among students are held constant. However, students with emotional disturbances are less engaged in the school experience than are students with other disabilities in both analyses. Although the most highly engaged students with disabilities are those with hearing or visual impairments, their engagement does not differ from students with learning disabilities when other differences, such as gender, household income, and school program characteristics are taken into account.

When examined in bivariate analyses, students' classroom engagement behaviors are related to class setting; students with disabilities who are in general education language arts classes are more likely than other students with disabilities to be rated as highly engaged and to be described as frequently participating in classroom discussions, completing homework on time, and working independently. However, these aspects of classroom behavior are not significantly associated with the amount of time spent in general education classes when other factors are taken into account, suggesting that the differences among the students in the settings may be related more to variations in classroom behaviors than to the settings themselves.

Other characteristics, such as demonstrating persistence and being female, are associated with higher levels of classroom engagement. Likewise, boys, students who are healthier, and students whose families are wealthier and more involved at home have lower levels of absenteeism than other students.

Several factors that characterize students' school programs and performance are also related to engagement. Participation in general education is associated with lower levels of absenteeism, although it is the only school program factor to relate to that measure. More frequent small group instruction is associated with higher classroom engagement in special education language arts classes and overall motivation for schooling. Similarly, frequent participation in class activities related to literature or skill development relates to higher classroom engagement scores across settings. Students who need and receive accommodations to tests or social adjustment supports have lower levels of engagement, independent of differences in other factors.

Clearly, factors associated with students' school programs play a role in helping students with disabilities maintain interest in school. Likewise, promoting personal characteristics, such as persistence, may be beneficial in encouraging these students' ongoing participation in the school experience.

4. The Academic Performance of Elementary and Middle School Students with Disabilities

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

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, SEELS' conceptual framework reflects this comprehensive view of educationally relevant inputs and achievements both in and outside of school.

Although the importance of a broad range of outcomes is recognized, academic performance remains central, as codified in NCLB, which 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 constrain their ability to be successful in school.

Although the importance of academic achievement is rarely questioned, reaching consensus regarding its measurement has been elusive. The measurement of academic performance, particularly for students with disabilities, continues to be a controversial topic among policymakers, measurement experts, and educators (Ahearn, 2000; Elliott, 1998; Johnson, 2000; Koretz & Hamilton, 1999; McGrew et al., 1995). Measuring academic performance can occur at multiple levels and serve multiple purposes. For example, classroom teachers often conduct formative and summative tests to evaluate students' progress in course content and provide grades for students and parents. State tests are designed to measure progress and to ensure accountability for results at the school or school district level. Other standardized tests are used in decision making processes to determine eligibility for special services. Each of these uses encompasses topics of debate and significant questions related to test design, types of assessments, types of decisions supported by the results, alternative assessments, and accommodations (Heubert & Hauser, 1999; Minnema, Thurlow, Bielinski, & Scott, 2001).

Within the 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. SEELS is designed to provide a national perspective on how students with disabilities are faring academically. This chapter presents descriptive findings and multivariate analyses of four views of academic performance: teacher-given grades, grade retention, deviations from expected grade-level performance in reading and mathematics, and standardized

test scores in reading and mathematics on the Woodcock Johnson III (WJIII; Woodcock, McGrew, & Mather, 2001).[1]

Indicators of Students' Academic Performance

This chapter assesses dimensions of students' academic performance that derive from teacher and school perceptions of the adequacy of that performance—course grades teachers give students and teachers' judgments that students' performance has fallen short enough of expectations that students should repeat a grade level. Measures also include test-based assessments—teachers' reports of previously tested reading and mathematics abilities and students' current reading and mathematics abilities as revealed by direct assessment using standardized tests.

Teachers' Perceptions of Students' Academic Performance

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 that is tied to the day-to-day business of teaching and learning. Although grades serve a number of important functions, perhaps their most important role is communicating to students and parents information about the students' mastery of course content and, presumably, overall progress on individualized education program (IEP) goals as well.

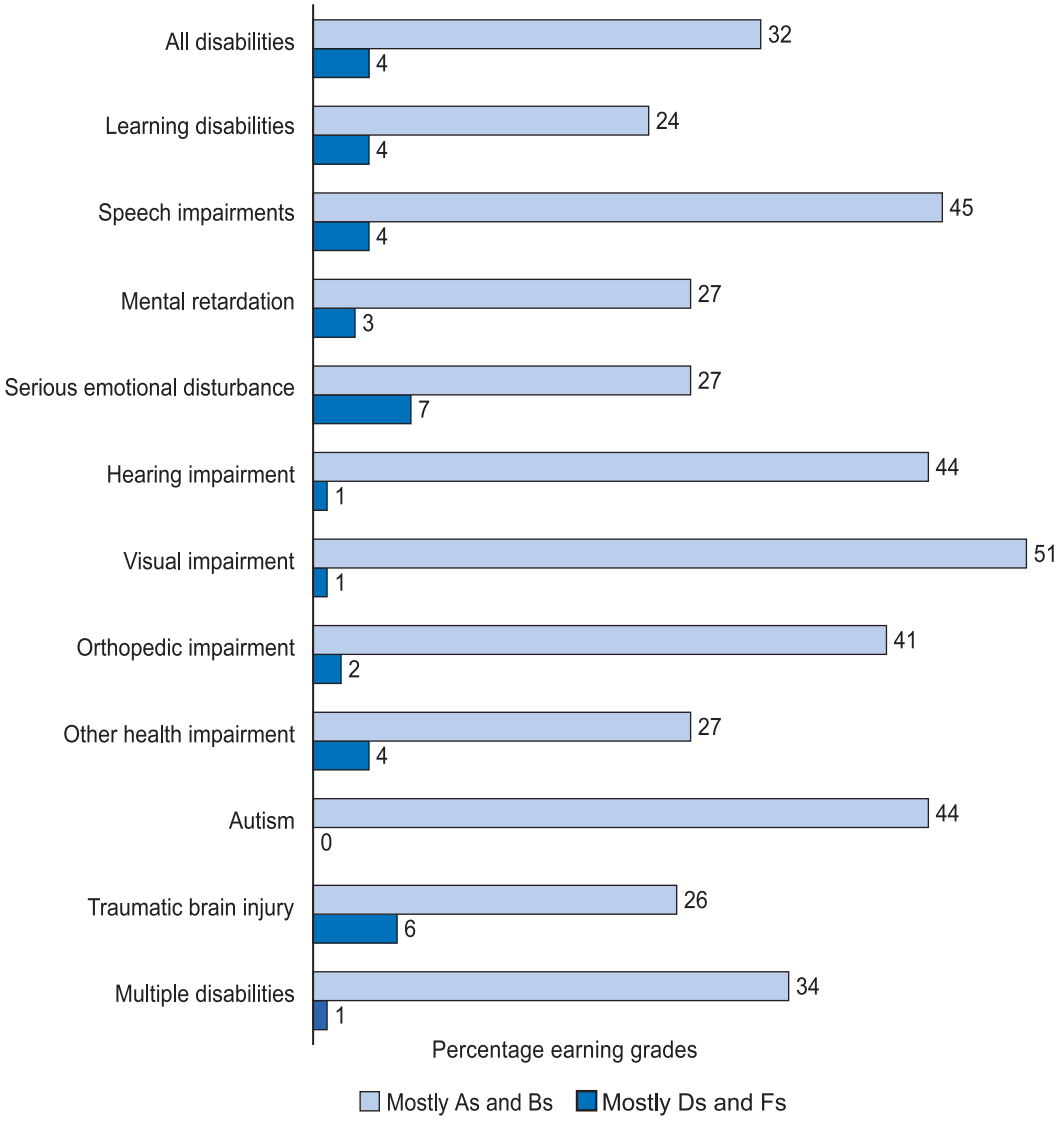
However, as a measure of academic performance, teacher-given grades have well-known limitations. Grade inflation can make comparison of grades across time suspect, variations in grading standards across schools and individual teachers can make it difficult to compare populations meaningfully, and grading standards differ significantly between special education and regular education classes. For example, special education teachers are less likely than general educators to consider homework or attendance to be important in grading student performance, but they are more likely to consider in-class participation to be important (Cameto, Marder, & Guzman, 2003). Finally, some special education students with severe disabilities and low functional skills do not receive grades at all, which skews the picture of student performance by including only higher-functioning students.

Despite these complicating factors, grades do indicate a degree of success both by a teacher's standards and by success relative to other students in the same classroom. They 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.

[1] Analyses similar to those reported in this chapter were conducted for secondary age students as part of the National Longitudinal Transition Study 2 (NLTS2) and are reported in Blackorby, Chorost, Garza, & Guzman, 2003.

Reports of students' overall grades would lead most students with disabilities and their parents receiving these results on report cards to conclude that students are making progress (Exhibit 4-1).

Exhibit 4-1
Reports of Students' Grades, by Disability Category



Source: Wave 1 parent interviews.
Standard errors and sample sizes are in Appendix B.

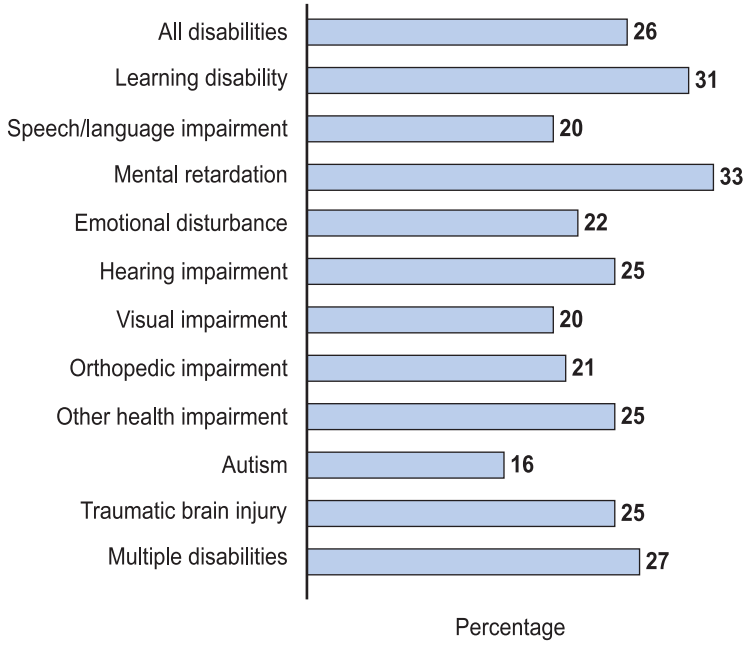
- High grades are common for students with disabilities; one-third receive As or Bs, according to parents' reports.
- At the other end of the grade scale, only 4% are reported to be getting Ds or below.
- This pattern of relatively high grades occurs across disability categories. At least 25% of students in all disability categories receive high grades, including students whose disabilities are cognitive in nature.
- However, receipt of high grades does vary by disability category. For example, 40% or more of students with speech, hearing, visual, or orthopedic impairments or autism receive grades on the high end of the spectrum. In contrast about one-fourth of students with learning disabilities, mental retardation, emotional disturbances, other health impairments, or traumatic brain injuries receive mostly As and Bs.
- Grades are not strongly related to the medical or biological severity of the disability. As many students with mental retardation receive high grades as students with learning disabilities (27% and 24%). Mental retardation is generally considered to present greater challenges to success in academic tasks than learning disabilities. A possible explanation is that students with mental retardation spend a greater portion of their day in special education classes (i.e., 75% vs. 38%) where grading standards often differ from those in general education classes.
- Similarly, students with emotional disturbances get much poorer grades than students with autism (27% vs. 44% receive mostly As and Bs) even though emotional disturbance generally is not associated with cognitive impairment. Autism often entails significant impairments, again leading to greater placement in special education classes and grading by different standards.
- Some students with disabilities may receive good grades on the basis of effort and achievement relative to their potential, rather than for performance according to state standards. Thus, an A given to a child with a significant cognitive disability, for example, would not reflect the same performance as that for the same grade given to a child without a cognitive disability.

Grade Retention

Moving from one grade level to the next is both an academic and a social achievement that most students experience each school year. This promotion is intended to signal that the student has acquired the skills and knowledge consistent with state standards for his or her grade level and is both capable and ready to transition to the next grade. However, some students who have not mastered the skills and knowledge nonetheless are "socially promoted" to the next grade. For decades, the public and policymakers have sought to balance different perspectives on grade retention and social promotion. One view is that promotion from one grade to the next implies that the academic skills and content have been adequately mastered so that the students will be prepared for the

increased demands of the next grade level. If students have not met those criteria, they should repeat the grade so that they have the opportunity to learn the necessary skills. Others argue that mastery of academic skills is important, but part of the educational process involves social development in terms of peer relationships and individual self-concept. When students are retained a grade, they are separated from their age peers and may suffer losses in motivation and self-esteem. Those losses may, in turn, further erode the students' ability to succeed in school. SEELS data show that a sizable number of students with disabilities have been retained at some point in their school careers (Exhibit 4-2).

Exhibit 4-2
Parents' Reports of Students Ever Being Retained, by Disability Category



Source: Wave 1 parent interviews.
Standard errors and sample sizes are in Appendix B.

- Parents of one in four students with disabilities report their children have been retained at some point in their schooling.
- Significant numbers of students in each disability category have been retained at some point in their educational career; however, students with learning disabilities and mental retardation are most likely to have been retained (e.g., approximately twice as likely as students with autism).

Reading and Mathematics Performance

In addition to grades, students both with and without disabilities are assessed in core academic subjects using standardized achievement tests. These tests may be

state accountability tests, high-stakes tests, or tests to determine eligibility for special education (Heubert & Hauser, 1999; Langenfeld, Thurlow, & Scott, 1997). Although they vary in their implementation across states, schools, and test publishers, they all address the core areas of reading and mathematics, and because their results typically can be reported with reference to a population norm, they provide a way to evaluate the academic achievement of students with disabilities in comparison to that of peers without disabilities (Thurlow & Johnson, 2000; Thurlow, Nelson, Teelucksingh, & Ysseldyke, 2000). SEELS has both direct assessment measures of students' reading and mathematics abilities and teachers' reports of the tested grade level equivalent of students' abilities in those areas.

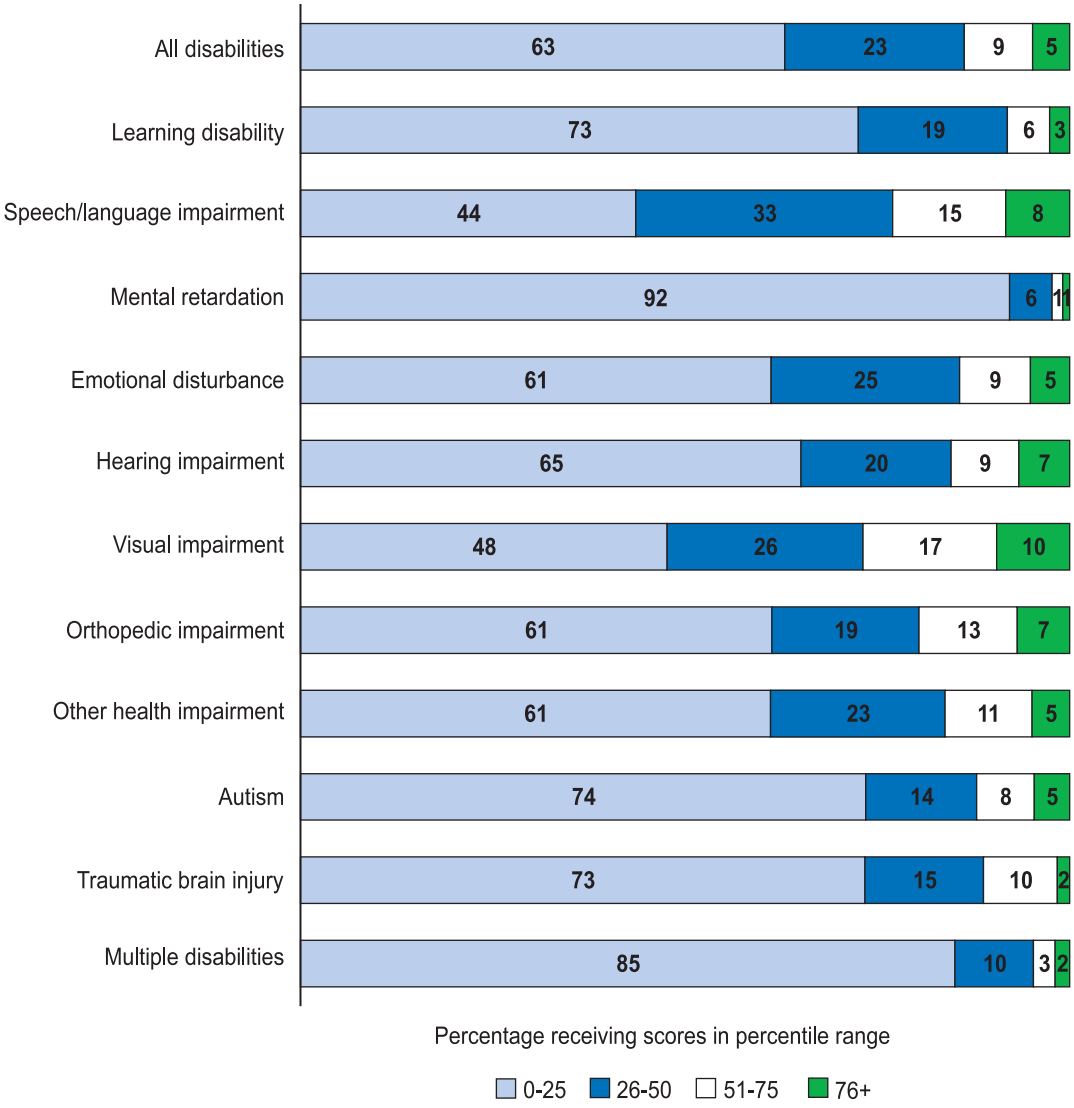
Woodcock Johnson Tests of Achievement

SEELS uses research editions of WJIII to conduct standardized assessments for reading and mathematics (Woodcock, McGrew, & Mather, 2001). WJIII is an individually administered test with excellent technical characteristics that has current norms and that many school districts use to assess students for eligibility for special education.

Passage comprehension. The WJIII passage comprehension test presents students with a series of items using a modified close procedure (i.e., fill in the blank), with the items ordinally ranked in difficulty. The least difficult items present a sentence in conjunction with a graphic representation, and students must provide the appropriate word to complete the sentence. The more difficult items are entirely text-based, address more technical topics, and require both greater vocabulary and ability to make inferences from context. Students who perform well on this test have well-developed linguistic and cognitive skills, as well as the ability to notice and use textual information.

In contrast to teacher-given grades, which suggest that most students with disabilities are making at least adequate progress, student performance on the WJIII test of passage comprehension (Exhibit 4-3) suggests that most students with disabilities do not fare well compared with peers in the general population, and therefore may not be achieving success to the degree that their high grades might suggest.

Exhibit 4-3
WJIII Passage Comprehension Scores (Percentile), by Disability Category



Source: Wave 1 direct assessment.
Standard errors and sample sizes are in Appendix B.

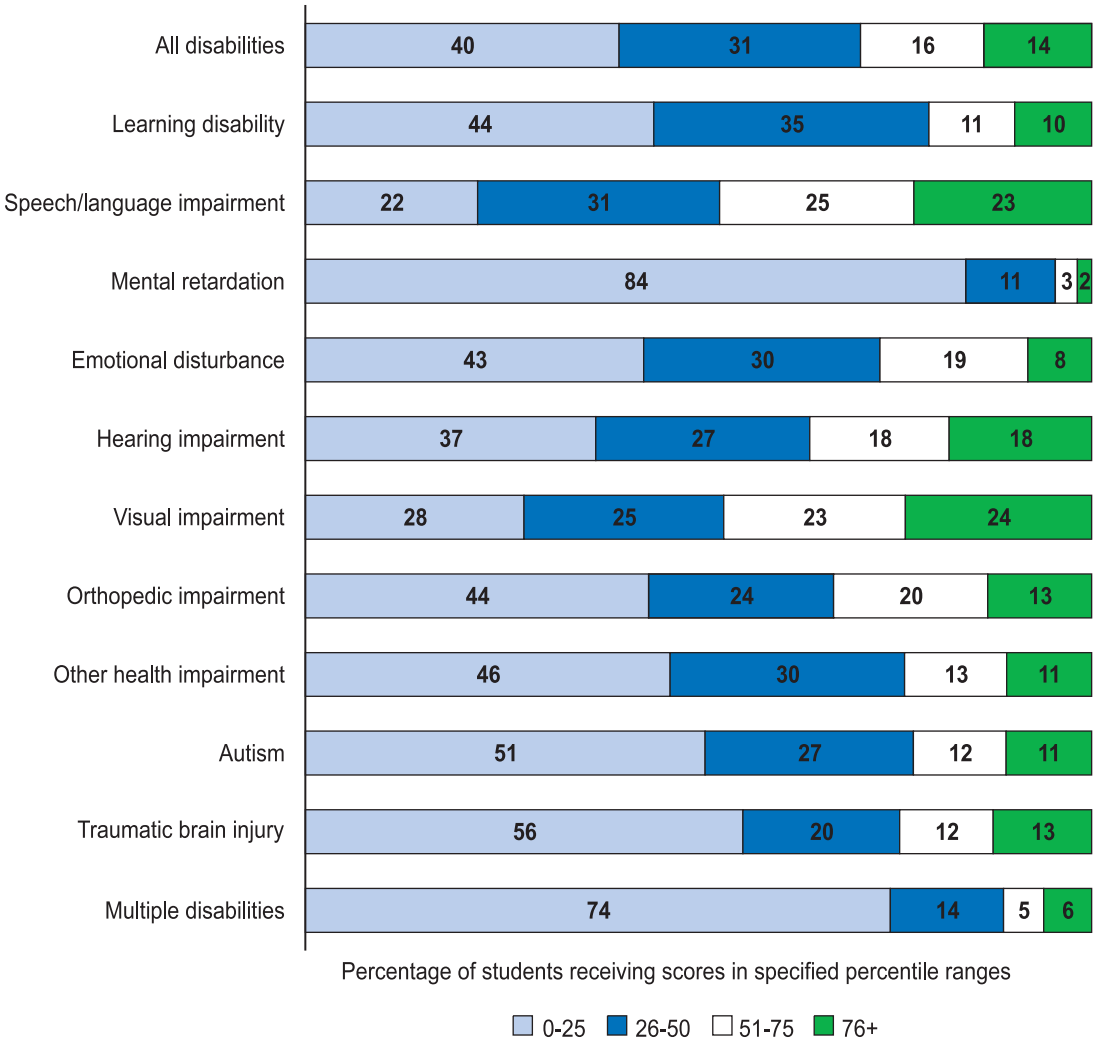
- Although some students with disabilities score above the 50th percentile in passage comprehension, nearly two-thirds of them score below the 25th percentile. This general pattern of the largest group of students in the lowest quartile is evident for students across disability categories. Among the largest group of students receiving special education—students with learning disabilities—3% score above the 75th percentile, whereas 73% score below the 25th percentile.

- In every disability category, some students' performance falls within each of the four quartiles. Students with speech or visual impairments have higher scores than peers in other disability categories and have a distribution of performance most like the general population of students, with 25% of students scoring above the 50th percentile. Students in other disability categories, particularly those associated with cognitive limitations or multiple disabilities, have lower scores than peers in other categories. More than 85% of students with mental retardation or multiple disabilities score in the lowest quartile.
- Students with learning disabilities, serious emotional disturbances, or hearing, orthopedic, or other health impairments have similar scores in passage comprehension and are in the middle of the range of disability categories.

Mathematics calculation. The WJIII calculation subtest measures students' computation skills, ranging in difficulty from elementary (e.g., simple addition) to advanced (e.g., integrating a function). Students are presented with a worksheet that presents the mathematics problems. An important characteristic of these problems is that the employed notation signals the operation (e.g., addition) that is required to produce the correct result. If the student understands the notation, it tests his/her ability to accurately perform the computation. The least difficult items are simple single-digit addition problems, whereas the most difficult ones require knowledge of calculus.

As a group, students with disabilities perform considerably better in mathematics calculation than they do in passage comprehension, and the pattern of results with respect to disability category is similar in the two tests (Exhibit 4-4). However, student performance in calculation still suggests that a considerable gap exists between students with disabilities and their peers in the general population.

Exhibit 4-4
WJIII Mathematics Calculation Scores (Percentile), by Disability Category



Source: Wave 1 direct assessment.
Standard errors and sample sizes are in Appendix B.

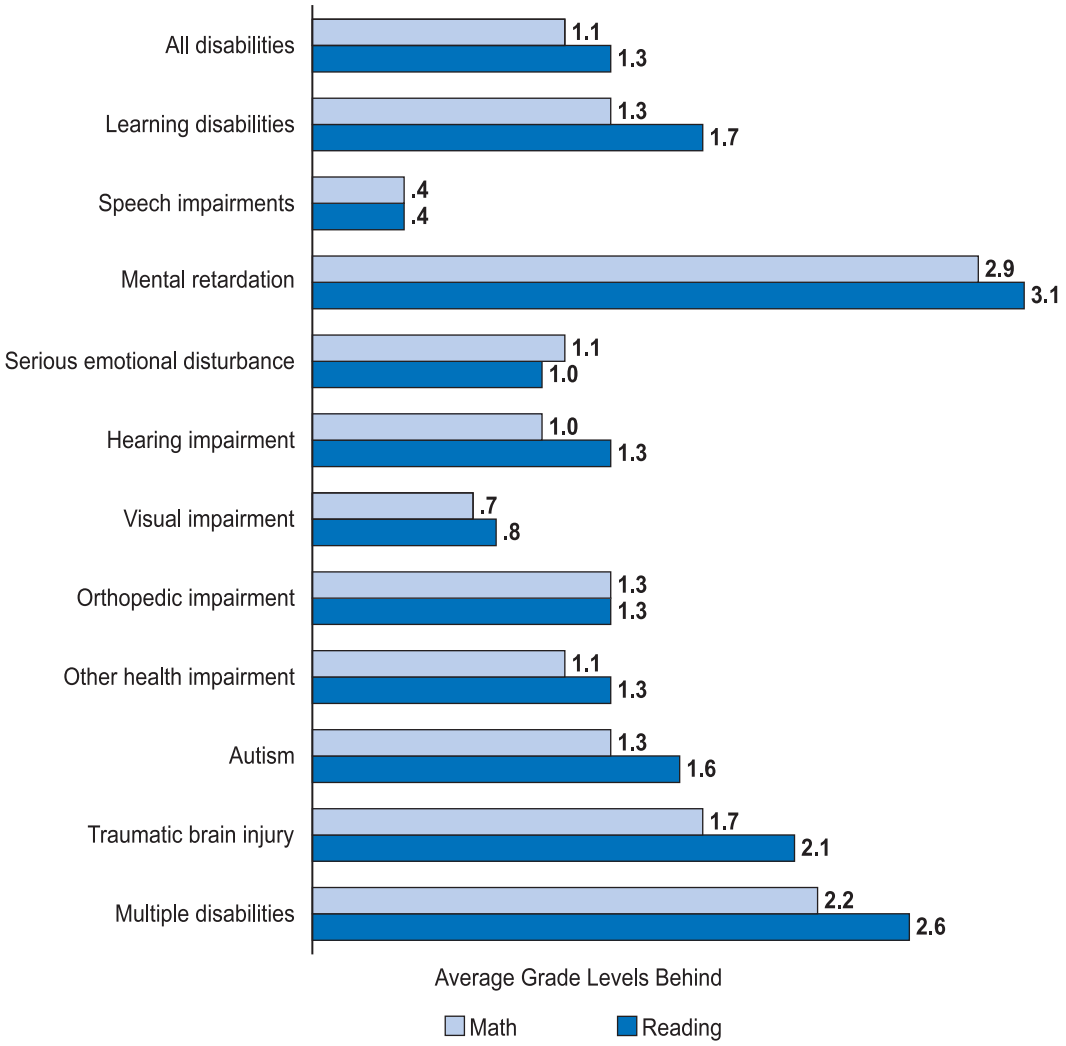
- Overall, 30% of students with disabilities score above the 50th percentile in mathematics calculation, whereas 40% score below the 25th percentile.
- As in the case of passage comprehension, considerable variation occurs across disability categories. Students with speech or visual impairments have higher scores in calculation than peers in other disability categories, with 48% and 47% of such students scoring at or above the 50th percentile, respectively.
- Students with mental retardation or multiple disabilities have the lowest scores in calculation, with about three-fourths of them receiving scores in the lowest quartile.

- Although students in all categories do better in mathematics calculation than passage comprehension, the difference is greatest among students with learning disabilities or speech, hearing, or visual impairments. Students in these categories have scores that average 12 percentile points better in calculation than in comprehension.

Discrepancy between tested and actual grade level. 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. SEELS 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 or behind their actual grade level students are functioning. A negative number indicates students are behind their grade level (e.g., a fourth-grade student who reads at the second-grade level would have a measure of -2 for reading), whereas a positive number indicates that students function in reading or mathematics ahead of their actual grade level (e.g., a third-grade student whose mathematics ability is equivalent to fourth grade would have a measure of +1 for mathematics). Average deviations then can be calculated for groups of students.

This view of student performance aligns more with WJIII test scores than with grades, in that teachers report that students with disabilities are approximately .9 years behind expected performance for their grade level in reading and .7 years behind in mathematics (Exhibit 4-5). These lags are significant, given the age of students, and are evident for students in all disability categories. Achievement gaps of this size, if not narrowed, may have significant implications for students' abilities to deal with the increasingly complex academic content that they will encounter as they advance in grade level.

Exhibit 4-5
Average Number of Grade Levels Students Are Behind in Reading and Mathematics, by Disability Category



Source: Wave 1 school program questionnaire.
Standard errors and sample sizes are in Appendix B.

- With average abilities within a few months of grade level, students with speech or visual impairments perform closer to expected levels in both reading and mathematics than other students with disabilities.
- Unlike the WJIII results, students in most categories have comparably large gaps in performance in reading and in mathematics.
- Students with mental retardation, traumatic brain injuries, or multiple disabilities are reported to perform much further from grade level expectations than other groups, scoring between 1.3 years and 2.5 years behind. Given that most of these students are in seventh grade or below, these differences are quite substantial.

- For students in other disability categories, reported performance is between .7 and 1.3 years behind grade level.

Relationships among Measures of Academic Performance

The relative rankings of disability categories on grades, likelihood of grade-level retention, reading and mathematics levels, and test scores are quite different in several cases. Whereas students with visual or speech impairments have among the highest grades and test scores and are among the least behind in their reading and mathematics abilities, other categories of students with disabilities who have relatively high grades have comparatively low test scores and are quite far behind grade level in reading and mathematics skills. For example, one in four students with mental retardation receive "mostly As and Bs" from their teachers, yet on average, they are 3 years behind grade level in reading and mathematics and have test scores overwhelmingly in the lowest quartile. In contrast, students with emotional disturbances or other health impairments are more likely to receive low grades than peers in many other disability categories but are closer to grade level in reading than any other categories of students with disabilities. Not surprisingly, then, the correlation between grades and other performance measures is nearly zero, whereas the observed correlation between reading and mathematics discrepancies and test scores is .75 ($p<.001$).

These patterns reflect schools' use of different metrics to measure performance and provide multiple perspectives on the performance of students with disabilities as a whole, as well as students in particular disability categories.

Factors Associated with Academic Performance

Indicators of academic performance—grades, teacher-reported discrepancies between reading and mathematics performance, and test scores from WJIII—were analyzed in relationship to independent variables related to the individual students, their households, and their school programs and experiences (Exhibit 4-6).

Individual Characteristics

Disability characteristics. As the descriptive results suggest, disability category is a significant factor in explaining variation in all of the achievement measures:

- Controlling for other factors, students with hearing or visual impairments, autism, or multiple disabilities all receive better grades than the reference group—their peers with learning disabilities.
- Students with emotional disturbances; hearing, visual, orthopedic, or other health impairments; or autism are closer to grade level in reading than are students with learning disabilities. Further, students with emotional disturbances or visual impairments score 5 to 6 points higher in WJIII

passage comprehension compared with students with learning disabilities, other differences between them held constant.

- Relative to students with learning disabilities, students with hearing impairments are both closer to grade level in mathematics and have higher test scores on the WJIII calculation subtest, other factors held constant.
- Students with mental retardation or multiple disabilities, who are nearly one-half year further from grade level in mathematics than students with learning disabilities, have WJIII calculation test scores more than 7 points lower, controlling for other factors.
- The mathematics performance of students in other disability categories is approximately equal to that of students with learning disabilities.
- Among the measures of academic performance considered here, having ADD/ADHD, independent of other disabilities, relates only to lower grades.
- Independent of the nature of a child's disability category, students whose disabilities are detected at an earlier age are somewhat more likely to receive lower grades, yet they perform somewhat better on the WJIII test of passage comprehension than those whose disabilities were diagnosed when they were older.

Exhibit 4-6
Differences in Measures of Academic Performance Associated with Individual Students' Characteristics

	Estimated Difference In:[a]					
	Grades[b]	Number of Grade Levels behind in Reading	Number of Grade Levels behind in Mathematics	WJ3 Passage Comprehension	WJ3 Mathematics Calculation	Comparison Categories
Disability characteristics						
Students classified with:						
Speech impairment[c]						vs. learning disability[c]
Mental retardation			**-.5*** **		**-7.5*** **	vs. learning disability
Emotional disturbance		**.5*** **		**4.8**		vs. learning disability
Hearing impairment	**.4**	**.1**	**.1**		**3.8**	vs. learning disability
Visual impairment	**.5**	**.8*** **		**5.7*** **		vs. learning disability
Orthopedic impairment		**.3**	**-.3*** **			vs. learning disability
Other health impairment		**.3**				vs. learning disability
Autism	**.9*** **	**.5*** **				vs. learning disability
Traumatic brain injury						vs. learning disability
Multiple disabilities	**.4**		**-.4**	**-6.2**	**-10.1*** **	vs. learning disability
Attention deficit /hyperactivity disorder (ADD/ADHD) [d]	**-.2**					Yes vs. no
Age at identification	**-.2**			**2.3**		8 years vs. 4 years
Number of problem domains						Three vs. one
Functioning						
Self-care skills for students with:						
Low cognitive skills				**9.3**		High vs. low (8 vs. 4)
Average cognitive skills	**-.6**	**-.7**		**-7.8**	**-5.9**	High vs. low (8 vs. 4)
High cognitive skills		**-1.0**		**-17.7*** **	**-12.3**	High vs. low (8 vs. 4)
Cognitive skills for students with:						
Low self-care skills		**2.1*** **	**1.3**	**43.0*** **	**32.8*** **	High vs. low (16 vs. 4)
Average self-care skills	**.5**	**1.4*** **	**1.3*** **	**20.9*** **	**18.6*** **	High vs. low (16 vs. 4)
High self-care skills	**.5**	**1.3*** **	**1.3*** **	**15.9*** **	**15.5*** **	High vs. low (16 vs. 4)
Social skills	**.4**			**-5.4*** **	**-3.4**	High vs. low (27 vs. 17)
Persistence	**.6*** **					Very often vs. rarely (3 vs. 1)
Demographics						
Age		**-1.2*** **	**-1.2*** **	**-6.8*** **	**-5.8*** **	12 vs. 9
Gender			**.1**		**2.5*** **	Male vs. female
Race/ethnicity						
African American			**-.2**			vs. white
Hispanic						vs. white
Other						vs. white
Primarily uses language other than English at home						Yes vs. no

[a]Statistics in this exhibit are calculated from models that include all individual characteristics, as well as household characteristics (results shown in Exhibit 4-7) and school programs and experiences (results shown in Exhibit 4-8). All statistics in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.
[b]Grades are measured on a 9-point scale, ranging from "mostly As" and" mostly As and Bs" to "mostly Ds and Fs" and "mostly Fs."
[c]Multivariate analyses require that, for categorical variables, such as disability category, each category be compared with another specified category. Learning disability was chosen as the category against which to compare the relationships for other disabilities because it is the largest disability category. Similarly, white is the reference group for ethnicity because it is the largest.
[d]ADD/ADHD is included to determine its relationships as a primary or secondary disability to academic performance, independent of youth's primary disability category.
Exhibit reads: In a school year, the grades of students with autism are .9 point higher on a 9-point scale than the grades of students with learning disabilities, other factors being equal. The mathematics test scores of 12-year-olds are 1.2 years farther behind their grade level than the scores of 9-year-olds, other differences held constant. Other analysts could choose different comparisons (e.g., 11- and 12-year-olds), which would result in a different estimate, but would have no effect on its statistical significance.

Functioning. Beyond the influence of identified disability categories, students' functioning also influences their ability to succeed academically.

- Students' self-care skills (e.g., dressing, feeding) and functional cognitive skills (e.g., counting change, looking up addresses) are related to several of the academic performance measures. The difference in achievement between students with low and high self-care scores depends in part on their level of cognitive functioning. For example, among students with high cognitive skills, those who also have high self-care abilities (e.g., students with learning disabilities) have much lower WJIII reading and mathematics test scores—by 18 and 12 points, respectively—than students with equally high cognitive abilities but low self-care skills (e.g., a high-functioning student with cerebral palsy that limits physical functioning). In contrast, among peers with low cognitive skills, having high self-care skills is associated with higher reading scores (9 points).
- Accenting the demand on cognitive function from academic learning activities, students rated with higher functional cognitive skills perform better on most of the academic outcome measures, but the magnitude of the association varies considerably for students at different levels of self-care ability. For example, among students with high self-care skills, having higher cognitive skills is reflected in having grades a half point higher, being more than a year closer to grade level in reading and mathematics, and having scores on the WJIII comprehension and calculation tests 16 points higher than students with high self-care abilities but low cognitive skills. Among students with low self-care skills, the effect of having high cognitive skills is also positive, but much greater, being particularly dramatic for the WJIII test scores. The 40-point higher score estimated for students with low self-care skills who have high cognitive skills relative to those with low cognitive skills is quite large, considering the 15 point standard deviation on the standard score scale of the WJIII tests.
- Controlling for other factors, students rated with high social skills obtain higher grades but have lower test scores in passage comprehension (5 points) and calculation (3 points) compared with peers rated with low social skills.
- Students who are reported to exhibit greater persistence in completing tasks (perhaps including homework) receive higher grades than peers who exhibit less persistence.

Student demographics. Studies have demonstrated a 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 without disabilities (National Center for Education Statistics, 2002).

- In these multivariate analyses, age is significantly related to four of five measures of academic performance. Controlling for other factors, older students are more than a year farther behind in both reading and mathematics

and have lower test scores by 7 points for WJIII passage comprehension and 6 points for mathematics calculation than younger students, suggesting that students with disabilities may continue to lose ground relative to their peers as they progress through school.

- Independent of other factors, gender is a factor only in mathematics performance, whereby boys are closer to grade level and have higher test scores in calculation—a pattern also noted in the general population (National Center for Education Statistics, 2002).
- Compared with white students, African-American students with disabilities are further from expected grade level performance in mathematics but are not disadvantaged in the other measures of academic performance. Being Hispanic or of another racial/ethnic group is associated with academic performance that is not different from white students with disabilities, independent of other differences between them.

Household Characteristics

SEELS multivariate analyses show that household income and parental support and expectations are related to several aspects of academic performance (Exhibit 4-7).

- Students from higher-income households show a consistent pattern of higher performance, controlling for disability and other factors. They receive better grades than peers from lower-income households, perform closer to grade level in both reading and mathematics, and score 2 points better on the WJIII passage comprehension test.
- Parental expectations for future education are significantly related to most measures of academic performance. Parental expectations that their children "definitely" will attend postsecondary school are associated with students having higher grades, being closer to grade level in reading and mathematics, and scoring nearly 3 points higher on the WJIII passage comprehension test relative to students whose parents believe they "probably won't" pursue postsecondary education.

Exhibit 4-7
Differences in Measures of Academic Performance Associated with Household Characteristics

	Estimated Difference In:[a]					
	Grades[b]	Number of Grade Levels behind in Reading	Number of Grade Levels behind in Math-ematics	WJIII Passage Compre-hension	WJIII Mathe-matics Calculation	Comparison Categories
Income	**.2**	**.2*** **	**.1**	**2.1*** **		$55,000 to $60,000 vs. $20,000 to $24,000 (12 vs. 5)
Expectations for postsecondary education	**.5*** **	**.2**	**.2**	**2.6**		Definitely will vs. probably won't (4 vs. 2)
Family involvement at home	**-.4*** **			**1.8**		High vs. low (8 vs. 5)
Family involvement at school	**.2**					High vs. low (8 vs. 5)

[a]Statistics in this exhibit are calculated from models that include the household characteristics shown in this exhibit, as well as individual characteristics (results shown in Exhibit 4-6) and school programs and experiences (results shown in Exhibit 4-8). All statistics in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.
[b]Grades are measured on a 9-point scale, ranging from "mostly As", and "mostly As and Bs" to "mostly Ds and Fs" and "mostly Fs" (see Chapter 1 for further details).
Exhibit reads: In a school year, the grades of youth with household incomes of $55,000 to $60,000 are .2 point higher on a 9-point scale than the grades of youth with household incomes of $20,000 to $24,000. The passage comprehension scores of youth with high family support at home are 1.8 points higher than the scores of students with low family involvement at home. Other analysts could choose different comparisons (e.g., $30,000 to $34,000 and $40,000 to $44,000), which would result in a different estimate, but would have no effect on statistical significance.

- Family involvement at school shows relationships with teacher-given grades but not with the other indicators of academic performance. Higher levels of family involvement at school are related to students receiving slightly higher grades, whereas greater involvement at home is associated with lower grades. This difference may result from parents being more likely to help with homework when students are receiving poor grades; help with homework is a key part of the scale of family support at home. Higher levels of family involvement at home also are associated with higher WJIII passage comprehension scores.
- No household factors addressed in SEELS are significantly related to mathematics computation scores.

School Programs and Experiences

The final set of variables included in these multivariate 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.

- Aspects of students' school programs and experiences are less strongly related to teacher-given grades than to other measures of academic performance.
- Participation in general academic education classes by students with disabilities has increased over the past decades, and it appears that students able to participate to a greater degree in general education have achieved some success. Students with disabilities who spend three-quarters of their class time in general education settings are closer to grade level in both reading and mathematics than peers who spend a quarter of their time there (Exhibit 4-8). Moreover, these same students score nearly 7 points higher on both the WJIII passage comprehension and calculation tests, controlling for other factors.
- SEELS analyses show that students with disabilities in smaller classes receive lower grades but are closer to grade level in both reading and mathematics, independent of other factors in the analyses.
- Students' needs for curriculum modifications are related to several aspects of achievement. Students who are able to participate in an unmodified language arts curriculum are closer to grade level in both reading and mathematics than peers whose needs require substantial curriculum modifications, controlling for other factors. This difference also is reflected in a difference of 5 points on the WJIII passage comprehension test and 2 points on the WJIII calculation test.
- Students who receive accommodations to gain access to instruction and assessment also frequently have lower levels of achievement. Therefore, although the accommodation may raise student performance, it may not raise it 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 SEELS analyses. Students who receive instructional or testing accommodations (e.g., more time for assignments or tests, shorter assignments, modified grading standards) have lower grades, perform further from grade level in both reading and mathematics, and have lower test scores on passage comprehension and mathematics calculation than peers who receive (and presumably need) no accommodations.

Exhibit 4-8
Differences in Measures of Academic Performance Related to School Programs and Experiences

	Estimated Difference In:[a]					
	Grades[b]	Number of Grade Levels behind in Reading	Number of Grade Levels behind in Math-matics	WJIII Passage Compre-hension	WJIII Mathe-matics Calculation	Comparison Categories
School Programs						
Percentage of time in general education academic classes		**.4*** **	**.4*** **	**7.2*** **	**6.8*** **	75% vs. 25%
Class size	**-.2**	**.2*** **	**.2*** **			22 students vs. 10
Modifications to curriculum materials		**-.7*** **	**-.4*** **	**-5.2*** **	**-2.2**	Substantial modification vs. no modification
Number of modifications to tests	**-.1**	**-.2*** **	**-.2*** **	**-2.7*** **	**-1.9*** **	Three vs. none
Number of social adjustment supports provided		**.3**	**.2**			Two vs. none
Number of presentation/ communication aids provided						Two vs. none
Tutoring						Yes vs. no
Degree of whole class instruction						Frequent (4) vs. rare (1)
Degree of small group instruction						Frequent (4) vs. rare (1)
Degree of individual instruction from teacher			**-.3**	**-5.4**		Frequent (4) vs. rare (1)
Participation in:						
General classroom activities		**.4**	**.5*** **	**3.9**		Frequent (22) vs. occasionally (10)
Literature-related activities		**.4*** **	**.3**	**10.4*** **	**7.3*** **	Frequent (12) vs. occasionally (6)
Skills-based activities						Frequent (12) vs. occasional (6)
Education level of language arts teacher						BA with credential vs. BA
Other School Experiences						
Retention at grade level	**-.2*** **	**.1**	**.2*** **			Yes vs. no
Absenteeism	**-.3**			**2.2**		5 days vs. 0 days
School mobility						Three school changes vs. none

[a]Statistics in this exhibit are calculated from models that included the characteristics shown in this exhibit, as well as individual characteristics (results shown in Exhibit 4-7), and household characteristics (results shown in Exhibit 4-8). All statistics in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.
[b]Grades were measured on a 9-point scale, ranging from "mostly As", and "mostly As and Bs" to "mostly Ds and Fs" and "mostly Fs."
Exhibit reads: In a school year, the grades of students who spend 75% of their class time in general education classes score 7 points higher on passage comprehension than students who spend 25% of their time in general education classes, other factors being equal. Other analysts could choose different comparisons (e.g., 40% and 60%), which would result in a different estimate, but would have no effect on its statistical significance.

- This principle does not appear to apply equally to all types of accommodations or supports, however. In contrast to findings for instructional and testing accommodations, students receiving presentation or communication accommodations (e.g., help from a reader or interpreter, communication aids) do not demonstrate different academic performance than nonrecipients, other factors being equal.
- Students who need and receive supports for social adjustment are closer to expected grade level performance in reading and mathematics than peers who do not, controlling for other factors.
- Classroom grouping approaches illustrate a similar pattern to that of accommodations. The frequency of whole-class and small-group instruction is unrelated to any of the academic outcome measures. However, students who require and receive frequent individual instruction from a teacher perform further from grade level in mathematics and have lower WJIII passage comprehension scores (5 points) than students who rarely have such help.
- Compared with students who occasionally participate in general class activities, students with disabilities with higher levels of participation in general class activities (e.g., answering questions, participating in class discussions), as well as literature-oriented activities (e.g., literature, poetry, writing), have higher grade level performance in reading and mathematics and higher WJIII passage comprehension (4 points and 10 points, respectively). In the case of literature-oriented activities, frequent participation also is associated with higher test scores for mathematics calculation (7 points).
- Neither receiving tutoring nor having programs that frequently focus on skill-building activities (e.g., phonics, vocabulary) are associated with the five academic outcome measures.

Other School Experiences

- Relationships exist between a variety of current and past experiences of students with disabilities and their academic performance. For example, students who have been retained at grade level at some point during their school career have lower grades but perform closer to grade level in reading and mathematics than peers who had not, controlling for other factors.
- When students miss class, they are assumed also to miss the opportunity to access new curriculum content, ask questions, or generally participate in class activities, and those missed opportunities adversely affect learning. SEELS multivariate models only partially support this perspective, however. Higher levels of absenteeism are related to lower grades but also to higher test scores in passage comprehension, other differences between students held constant.

- Changing schools frequently, for reasons other than changing grade levels, appears to have little relationship to student outcomes at this age level.

How Much is Explained?

The amount of variation in grade-level discrepancies and WJ test scores (r^2) explained by the factors discussed above increases substantially as each set of factors is considered. Disability and functioning alone account for 39% of variation in grade-level discrepancies in reading, 43% in grade-level discrepancies in mathematics, 37% of variation in WJIII passage comprehension, and 33% of WJIII calculation. When all factors are combined, the amount of variation explained increases to 54%, 55%, 53%, and 43%, respectively. In contrast, the fit for models predicting student grades is approximately 17% and does not substantially improve with the addition of independent variables beyond those related to disability and functioning.

Summary

Student academic performance is at the forefront of efforts to reform education now more than ever before, and the move to improve that performance specifically includes students with disabilities. The national look at academic performance of elementary and middle school students with disabilities that SEELS is enabling suggests that different indicators of performance present divergent perspectives on the progress that some students are making. When using the grades that teachers assign to students, most students with disabilities receive passing or even exemplary grades that would indicate successful accomplishment of curriculum goals. However, significant numbers of students in all disability categories have been retained at grade level at some point in their school careers and function significantly below grade level in reading and mathematics, thus raising the question of their ability to learn increasingly challenging course work. Standardized test scores in reading and mathematics illustrate considerable diversity in performance, but also show that many students with disabilities score in the lowest quartile can improve considerably. Interestingly, the correlation between grades and the other measures of academic functioning is nearly zero, indicating that teachers consider factors other than actual academic ability in grading. The correlation between the two test-based measures—WJIII scores and tests and grade-level discrepancies—is high.

Individual, household, and school program factors all contribute significantly to explaining variation in 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 students fare academically, choices made at the school level regarding programs, services, and supports also are related to student performance. What schools do can make a difference in the academic performance of students with disabilities.

Although students' primary disability categories and the severity of their disabilities play important roles in analyses across indicators, different disabilities relate to outcomes differently. Controlling for other factors, students with sensory impairments receive higher grades, are closer to grade level in reading, and have better test scores than their peers with learning disabilities. In contrast, students with emotional disturbances are closer to grade level in reading, have significantly higher scores in passage comprehension, but do not differ from those with learning disabilities in grades received. Students with mental retardation or multiple disabilities face persistent challenges, with comparatively low scores in passage comprehension and calculation, and they are further from grade level in those subjects, even though they have higher grades than peers with learning disabilities. Moreover, students with higher cognitive skills exhibit a pattern of better performance in grades, grade level discrepancies, and standardized test scores than peers who have lower functional cognitive skills—a pattern that is particularly pronounced among those who have low self-care skills. Many students with low self-care skills but high cognitive skills perform well on achievement tests.

Demographic and family background factors are significantly related to academics as well. Students with disabilities from low-income families score significantly below higher-income peers on most measures of academic performance. SEELS multivariate analyses also show that the involvement and expectations of parents are related to some, but not all, academic outcomes that students achieve. Students with disabilities whose parents expect them to attend postsecondary school receive significantly higher grades, are closer to grade level in reading and mathematics, and have higher standardized test scores than their peers whose parents do not hold those expectations. Similarly, students whose families are involved in school activities have better grades.

School program factors, too, are associated with variations in student performance. For example, controlling for other factors, students who spend more of their class time in general education settings perform closer to grade level and have higher achievement test scores than peers who spend less time there. In addition, receiving social supports is positively related to being closer to grade level. However, students who require and receive accommodations in testing are further behind grade level and have lower test scores in reading and mathematics than peers who do not require or receive the accommodations, other factors held constant. Finally, active participation in class activities generally and in activities related to literature in particular are associated with being closer to grade level and having higher test scores in reading and mathematics. This suggests that choices regarding placements, groupings, and supports sometimes relate to performance but that the effectiveness of specific supports requires longitudinal analysis of the growth in academics experienced by 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 such services. Future SEELS analyses will to address these issues.

5. The Social Adjustment of Elementary and Middle School Students with Disabilities

By Carl Sumi, Camille Marder, and Mary Wagner

Middle childhood is a time of dramatic physical, cognitive, emotional, and social change (Cole & Cole, 1993). Children develop on many levels, entering new endeavors and worlds daily. They begin to learn how to establish healthy relationships, find socially acceptable ways to engage in activities that interest them, and make their way through school. However, a number of children experience more trials than their peers (Ford & Coleman, 1999). Some are unable to find solid emotional and social ground as they progress through their developmental stages. An inability to "fit it" can have behavioral manifestations that cause significant difficulty for both children themselves and those around them. When a child's behavior violates the accepted norms at home, at school, or in the community, negative repercussions can result, such as suspensions or expulsions from school.

Many children with disabilities encounter additional hurdles that complicate this difficult time of childhood. As they approach adolescence, when being like their peers is a high priority, many disabilities set children 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 especially associated with social adjustment difficulties. The increased challenges of disabilities and their implications result in children with disabilities facing a greater risk than their peers without disabilities for poor outcomes.

Special education services provided to students with disabilities can address the behavioral issues that challenge their positive social adjustment. In fact, IDEA '97 requires the team that plans a students' individualized education program (IEP) to consider, if appropriate, strategies and supports to address behavior that impedes a student's learning or that of others [34CFR300.346(a)2(i)]. To help strengthen such supports and target them effectively to students who can benefit most from them, it is important to have a clear picture both of how students with disabilities fare on the multiple dimensions of the complex construct of social adjustment and of the factors that are associated with more positive adjustment.

This chapter examines the social adjustment of elementary and middle school students 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 students with disabilities are described and the relationships among them identified. Next, variations in social adjustment across

the various disability categories are presented. Finally, findings from multivariate analyses highlight the associations of individual and family characteristics, school programs and experiences, and services with social adjustment.[1]

Dimensions of Social Adjustment of Students with Disabilities

General Social Skills

Whereas some social behaviors are specific to a particular setting, such as the classroom, others are so general 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 wide array of items, the Social Skills Rating System (SSRS; Gresham & Elliott, 1990b) is a widely accepted tool for measuring general social skills.

Using items from the SSRS, parents of students with disabilities were asked to report how often students demonstrate the aspects of social competence depicted in Exhibit 5-1. The possible responses were "very often," "sometimes," or "never."

- Approximately half or more of students receive ratings of "very often" for several behaviors, including making friends easily (58%), avoiding situations that are likely to result in trouble (51%), speaking in an appropriate tone of voice at home (50%), and starting conversations rather than waiting for others to start (49%).
- Approximately one-third or more of students with disabilities receive ratings of "very often" in the areas of cooperating with family members (39%), controlling his or her temper (37%), and joining group activities without being told to do so, and ending disagreements calmly with parents (32%).
- Receiving criticism well appears to be the most problematic behavior; 16% of students with disabilities are reported to do so "very often."
- Although the percentages of students who engage in each type of activity "very often" may be heartening, it also is important to consider how many students were reported "never" to engage in each type of activity. One quarter of students are reported to "never" receive criticism well, and 20% "never" join group activities without being told to do so.
- A significant percentage of students with disabilities are reported to have poor skills with regard to conflict situations. Approximately 15% are reported "never" to end disagreements with parents calmly (16%) or control their temper when arguing with other students (13%).

[1] Analyses similar to those reported in this chapter were conducted for secondary school students as part of the National Longitudinal Transition Study-2 (NLTS2) and are reported in Marder, Wagner, & Sumi, 2003.

- Approximately one-tenth of students are reported "never" to start conversations rather than waiting for others to start, avoid situations that are likely to result in trouble, or seem confident in social situations.
- Compared with students without disabilities, students with disabilities tend to be rated as less skilled socially. For example, they are more likely to receive a rating of "never" regarding joining group activities and speaking in an appropriate tone and are less likely to "very often" make friends easily or control their tempers. However, a higher percentage of students with disabilities received a rating of "very often" for avoiding situations that are likely to end in trouble.

Exhibit 5-1
Parents' Ratings of the Social Skills of Students with Disabilities and Students in the General Population

	Students with Disabilities [a]		Students in the General Population [b]	
	Never	Very Often	Never	Very Often
Percentage of students who:				
Make friends easily	5.6	57.7	2.0	64.6
Avoid situations that are likely to result in trouble	9.8	51.2	4.7	38.0
Speak in an appropriate tone of voice at home	5.4	49.8	1.4	50.5
Start conversations rather than waiting for others to start	10.1	48.8	7.5	44.0
Seem confident in social situations, such as parties or group outings	9.4	44.1	7.6	47.2
Cooperate with family members without being told to do so	6.6	38.6	2.6	38.2
Control his or her temper when arguing with other children	12.9	36.6	9.9	47.7
End disagreements with parent calmly	15.5	31.8	11.2	33.3
Join group activities, such as a group having lunch together, without being told to do so	19.9	31.5	7.5	40.3
Receive criticism well	25.7	15.5	16.8	17.1

[a] Source: Wave 1 parent interviews.
[b] Source: American Guidance Service's SSRS national norms data.
Standard errors and sample sizes are in Appendix B.

Social Adjustment at School

The behavior of children at school is a crucial element in their overall social adjustment. Not only is school the context in which many students spend most of their day, it also is where they engage in the important activities of learning academic knowledge; acquiring and practicing more generalized skills, such as solving problems, being on time, and following directions; and developing formative relationships with peers and adults. Moreover, the consequences of their behavior at school can be powerful. As noted, 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).

SEELS is investigating three aspects of the social adjustment of students with disabilities at school: their behaviors in the classroom, their ability to get along with teachers and other students, and the extent to which they have been the subject of disciplinary actions for unacceptable behavior at school.

Classroom social behavior. To elicit information about students' social behavior in the classroom, SEELS asked students' language arts teachers to rate students using the SSRS items indicated in Exhibit 5-2. The possible responses were "very often," "sometimes," or "never."

- Most students receive high ratings on positive social adjustment. Over 50% of the students are reported to transition easily between classroom activities (54%) and to follow teacher (52%) directions "very often." A small percentage of students reportedly "never" exhibit these behaviors (5% and 2%, respectively).

Exhibit 5-2
Teachers' Ratings of the Social Skills of Students with Disabilities and Students in the General Population

	Students with Disabilities [a]		Students in the General Population [b]	
	Never	Very Often	Never	Very Often
Percentage of students with frequency of activity:				
Easily transitions between classroom activities	4.9	53.5	6.4	60.5
Follows teacher directions	1.6	51.5	1.7	62.5
Controls temper in conflict situations with peers	10.6	49.8	9.9	62.5
Cooperates with peers without prompting	4.7	46.3	4.0	56.4
Acts sad or depressed	54.9	7.1	61.5	5.8
Fights with others	54.8	6.8	61.0	6.3
Gets easily distracted	10.6	38.5	37.5	20.6

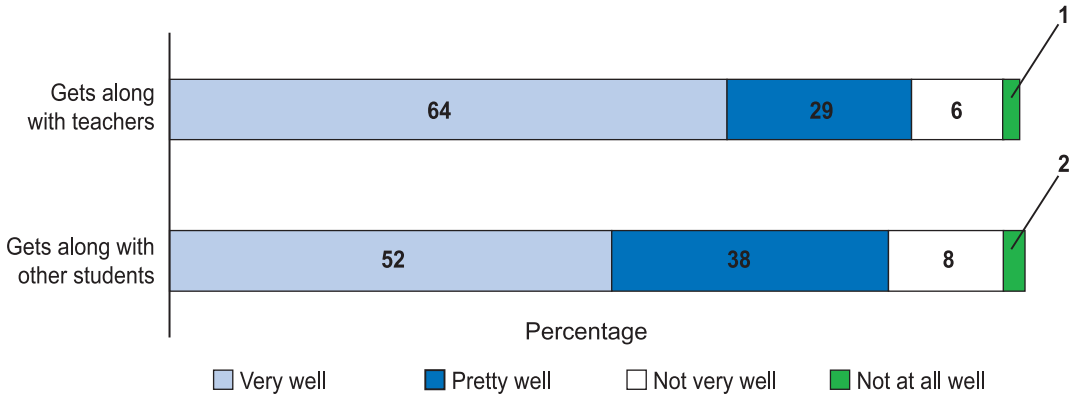
[a]Source: Wave 1 teacher questionnaires.
[b]Source: American Guidance Service's SSRS national norms data.
Standard errors and sample sizes are in Appendix B.

- Approximately 50% received ratings of "very often" in the areas of controlling their temper in conflict situations with peers (50%) and cooperating with peers without prompting (46%).
- More than half of the students are reported "never" to act sad or depressed or to fight with others (55%).
- Paying attention in class appears to have been the most difficult skill; more than one-third of students (39%) are reported to get easily distracted "very often."
- Overall, 11% of students received a rating of "never" for controlling their tempers in conflict situations, whereas approximately 5% were reported to "never" cooperate with peers without prompting.
- Compared with students without disabilities, students with disabilities are much less likely to receive positive ratings on most measures. For example, a much higher percentage of students with disabilities are said to get easily distracted "very often," and many fewer students with disabilities are reported to transition easily between activities, to follow teacher directions, to control their tempers, and to cooperate with peers "very often."

Parents' perspectives of students' social adjustment at school. To provide another perspective on students' social adjustment at school, parents were asked how well their sons or daughters get along with teachers and other children (Exhibit 5-3).

- According to parents, students get along better with teachers than with other children. Almost two-thirds (64%) reportedly get along "very well" with teachers, and 52% get along "very well" with other children.
- Parent ratings also show that about 10% of the children do not get along very well or at all well with other children; 7% do not get along very well or at all well with teachers.

Exhibit 5-3
Parents' Ratings of Students with Disabilities Getting Along with Teachers and Other Students



Source: Wave 1 parent interviews.
Standard errors and sample sizes are in Appendix B.

Problem behaviors at school. Although most students with disabilities are reported to be getting along well at school, some have problems at school. Parents were asked whether their children had ever been suspended or expelled and if they had been suspended or expelled during the current school year. Fourteen percent of children had been suspended or expelled, 8% in the current school year.

Social Adjustment outside the Classroom

Although the classroom is an important setting for students, social activities outside the classroom are crucial to their development as well. The lives of many children are substantially enriched by their participation in organized extracurricular groups, which are defined broadly to include adult-sanctioned organized activities that children do outside 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., Camp, 1990; Marsh, 1992) and to diminish the likelihood of students' dropping out of school (Mahoney & Cairns, 1997).

To understand the out-of-school social activities of students 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 or organized groups (Exhibit 5-4).[2]

[2] Friends may include children both with and without disabilities.

- Parents report that most students with disabilities are fairly socially engaged. Two-thirds (67%) belong to an organized group, with community groups being more common than school groups (50% vs. 29%).
- Almost two-thirds of students with disabilities get together with friends outside of class and organized groups at least once a week, although 9% of students reportedly "never" see friends outside of school or organized groups.
- When looking at both group membership and information friendship interactions, 81% of students are socially engaged; they get together with friends at least once a week or belong to at least one group. However, it is also important to be aware that 19% of students do neither.

In contrast to these aspects of social integration, some students 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 students with disabilities who were at least 12-years-old were asked whether those children had ever been arrested. Three percent of parents reported that their children had been arrested.

Exhibit 5-4
Social Interactions of Students with Disabilities

	Percentage
Participate in an extracurricular school group	29.3
Participate in an out-of-school group	50.5
Participate in any extracurricular school or out-of-school group	67.2
Get together with friends outside of school or organized groups:	
Frequently (four or more times a week)	26.1
Regularly (one to three times a week)	38.0
Occasionally (less than once a week)	26.7
Never	9.1
Are socially engaged—get together with friends at least once a week or belong to at least one group	81.0

Source: Wave 1 parent interviews.
Standard errors and sample sizes are in Appendix B.

Relationships among Dimensions of Social Adjustment

Although SEELS has investigated a variety of behaviors of students 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):

- Most correlations among the various indicators are statistically significant but modest; those that are significant range from .04 to .39.
- As a measure of general social competence, it is not surprising that the social skills scale score has correlations as high as .37. General social skills are moderately and positively correlated with interpersonal aspects of social adjustment, with correlations ranging from .19 with group membership, to .25 with the classroom social behavior scale and with seeing friends outside of groups, to .37 for getting along with teachers and students.
- Positive aspects of social behavior (i.e., general social skills, the ability to get along with others, and appropriate classroom behaviors) are negatively associated with disciplinary actions and arrests. The strongest correlation is between how well a student gets along with teachers and other students and how often disciplinary actions are administered (-.39).

Exhibit 5-5
Correlations among Indicators of the Social Adjustment of Students with Disabilities

	Classroom Social Behavior Scale[a]	Gets Along with Teachers and Students[b]	Belongs to a Group[a]	How Often Sees Friends Outside of Groups[a]	Has Received Disciplinary Action in the Current School Year[c]	Has Been Arrested[a]
Social skills scale score	**.25*** **	**.37*** **	**.19*** **	**.25*** **	**-.14*** **	**-.05**
Classroom social behavior scale score	**.25*** **	**.21*** **	**.14*** **	**.04**	**-.18*** **	**-.08**
Gets along with teachers and students			**.05*** **	**.07*** **	**-.39*** **	**-.16*** **
Belongs to a group				**.17*** **		
How often sees friends outside of groups					**.06*** **	**.05**
Has received disciplinary action in the current school year						**.24*** **

All correlations in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.
[a]Source: Wave 1 teacher questionnaire.
[b]Source: Wave 1 parent interviews, , and
[c]Source: Wave 1 student's school program questionnaire.

- Indicators of the social integration of students outside the classroom—the frequency of their friendship interactions and whether they belong to school or to community groups—are fairly weakly related to other indicators. Except for their relationship to overall social skills (.25 and .19) and to each other (.17), correlations of friendship interactions and group membership with other indicators of social adjustment are no higher than .14.

- Receiving disciplinary actions at school is mildly correlated with involvement with the criminal justice system (.24).

Another perspective on the interrelationships of general social competence to these aspects of social adjustment is provided by examining the profiles of students with high and low social skills scale scores (Exhibit 5-6). Students with high social skills scale scores have more positive social adjustment than lower scoring students on all indicators investigated in SEELS.

- For example, 52% of students with high social skills scale scores have high classroom social behavior scale scores, compared with virtually none of those with low social skills.

Exhibit 5-6
Relationship of Social Skills to other Indicators of Social Adjustment among Students with Disabilities

	Social Skills Rated as:		
	Low	Medium	High
Percentage with classroom social behaviors rated:[a]			
Low	1.8	.5	--
Medium	76.8	64.4	48.0
High	21.4	35.0	52.0
How well students get along with others[b]			
Not well	7.5	2.0	.5
Well or very well	72.7	90.6	98.1
Percentage who:			
Belong to a group[b]	57.8	71.1	78.8
See friends outside of groups at least weekly[b]	53.0	67.3	74.3
Have been the subject of a disciplinary action at school in the past year[c]	21.6	11.9	4.6

[a]Source: Wave 1 teacher questionnaire.
[b]Source: Wave 1 parent interviews.
[c]Source: Wave 1 students' school program questionnaire.
Standard errors and sample sizes are in Appendix B.

- Among students with high social skills scale scores, about three-fourths belong to at least one group and see friends outside of groups at least weekly, compared with 58% and 53%, respectively, of low-scoring students. Only 5% of students with high social skills had been the subject of a disciplinary action at school in the past year, compared with 22% of students with low social skills scale scores.

Disability Differences in Social Adjustment

Clearly, differences in disabilities are associated with differences in social adjustment. The very nature of some disabilities can create emotional, cognitive, or perceptual states that can result in social difficulties. Other types of disabilities involve communication limitations that can present challenges to social functioning. Still other types of disabilities are less likely to adversely affect students' social adjustment (Exhibit 5-7):

- Children with learning disabilities or speech, hearing, visual, or orthopedic impairments tend to excel, relative to other groups, on several measures of positive social adjustment. Between 73% and 82% in these disability categories score high or medium on the social skills scale, and between 29% and 44% score high on the classroom social behavior scale.
- Students with learning disabilities or speech impairments are joined by those with hearing or other health impairments as being the most likely to belong to a group or see friends outside of groups at least weekly; 80% or more do so. In contrast, 63% to 76% of the other disability categories, with the exception of autism (39%), do so.
- At the other end of the spectrum, approximately 48% of students with emotional disturbances and almost 60% of students with autism score low on the social skills scale. Students with emotional disturbances also are more likely to be the subject of disciplinary actions at school (49%) and involved with the criminal justice system (11%) than the next closest category of students (other health impairments).

Exhibit 5-7
Social Adjustment of Students, 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
Percentage with social skills scale score of:[a]											
High	9.9	14.5	4.3	2.8	10.3	12.9	11.2	6.7	1.7	4.3	5.4
Medium	62.7	66.8	56.6	49.8	65.9	61.7	65.6	58.1	40.0	56.5	55.9
Low	27.4	18.7	39.0	47.5	23.9	25.4	23.2	36.3	58.3	39.2	39.1
Percentage with classroom social behavior scale score of:[b]											
High	29.3	43.8	24.0	11.7	39.3	36.5	34.4	20.7	21.2	31.3	26.8
Medium	70.3	55.6	74.8	87.0	60.2	62.1	64.8	77.7	77.9	68.6	70.2
Low	0.4	0.6	1.2	1.3	0.5	1.4	0.8	1.6	1.0	0.1	3.0
Percentage who:											
Belong to a group or get together with friends at least weekly[a]	82.7	84.0	69.9	76.4	79.8	72.3	75.0	86.9	63.1	70.7	68.0
Have been subject to disciplinary action at school[c]	15.8	5.3	17.0	48.7	7.8	4.6	6.7	17.3	6.7	16.3	13.8
Have been arrested[a]	2.0	2.5	1.9	11.1	2.2	.0	1.4	3.6	0.6	2.3	4.3

[a]Source: Wave 1 parent interviews.
[b]Source: Wave 1 teacher questionnaire.
[c]Source: Wave 1 school program questionnaire.
Standard errors and sample sizes are in Appendix B.

Factors Related to Social Adjustment

Analyses presented thus far have demonstrated that the majority of students with disabilities are relatively well-adjusted socially; parents rate many 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, the social adjustment of students with different primary disability classifications differs dramatically. Clearly, much more is involved in understanding variations in the social adjustment of students 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 relationship between selected indicators of social adjustment and characteristics of the students 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. Three indicators of social adjustment are used: two indicators of positive

social adjustment—seeing friends at least weekly and belonging to groups; and one indicator of negative social adjustment—disciplinary actions in school.

Individual Characteristics

Three kinds of individual characteristics are considered: disability characteristics, functioning, and demographic characteristics.

Disability characteristics. 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:

- Given the nature of their disability, it is not surprising that students with emotional disturbances are the most likely of any students to have problems with social adjustment, as was apparent in the bivariate analyses. Although students with emotional disturbances are no more or less likely than students with learning disabilities to see friends often or belong to groups, they are 9 percentage points more likely than students with learning disabilities to be subject to disciplinary actions at school.
- Consistent with the disability category differences noted earlier in the chapter, students with visual impairments or orthopedic impairments, or autism are significantly less likely to belong to groups compared with students with learning disabilities, other factors held constant. They also less likely than their peers with learning disabilities to see friends outside of school or groups.
- Students whose parents report they have ADD/ADHD are more likely than students with learning disabilities to be the subject of disciplinary actions at school; however, they also are more likely than students with learning disabilities to see friends at least weekly.
- Independent of the category of their disability, students who were identified for special education services at an older age are less likely to see friends outside of groups than students identified at a younger age.
- Students whose disabilities affect more functional domains are less likely to see friends outside of groups and to receive disciplinary actions at school.

Exhibit 5-8
Differences in Measures of Social Adjustment Associated with Individual Characteristics of Students with Disabilities

	Estimated Difference in Probability of: [a]			
	Belonging to a Group	Seeing Friends Outside of Groups at Least Weekly	Receiving Disciplinary Action at School	Comparison Categories
Disability Category				
Students classified with:				
Speech impairment				vs. learning disability[b]
Mental retardation				vs. learning disability
Emotional disturbance			**9.1*** **	vs. learning disability
Hearing impairment				vs. learning disability
Visual impairment	**-10.1**	**-10.7**		vs. learning disability
Orthopedic impairment	**-9.8**	**-10.8**		vs. learning disability
Other health impairment				vs. learning disability
Autism	**-15.9*** **	**-20.7*** **		vs. learning disability
Traumatic brain injury				vs. learning disability
Multiple disabilities/deaf-blindness		**-9.2**		vs. learning disability
ADD/ADHD		**6.1**	**3.4*** **	Yes vs. no
Age at identification		**4.6**		8 years old vs. 4 years old
Number of domains in which a students has limitations		**-3.5**	**-1.7**	Three domains vs. one
Functioning				
Self care skills	**12.4*** **			High score (8) vs. low (4)
Functional cognitive skills	**7.7**	**8.4**		High score (15) vs. low (7)
Social skills	**7.1**	**27.9*** **	**-4.0*** **	High score (27) vs. low (17)
Demographic characteristics				
Age	**5.9*** **	**-4.7**	**3.3*** **	12 years old vs. 9 years old
Gender		**4.6**	**5.0*** **	Male vs. female
Student is:				
African-American			**7.5*** **	vs. white
Hispanic	**-17.2*** **			vs. white
Other ethnicity				vs. white
Uses primarily a language other than English at home	**-7.5**			Yes vs. no

[a]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). All statistics in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.
[b]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.
[d]ADD/ADHD is included to determine its relationships as a primary or secondary disability to academic performance, independent of youth's primary disability category.

Exhibit reads: Students with visual impairments are 10 percentage points less likely to belong to an organized group than students with learning disabilities, other factors being equal. Students with high social skills are 4 percentage points less likely than those with low social skills to be subject to disciplinary action at school. Other analysts could choose different comparisons (e.g., medium and low social skills), which would result in a different estimate, but would have no effect on its statistical significance.

Functioning. Higher functioning is associated with more positive social adjustment on all three measures; those with higher skills have a higher likelihood of positive adjustment and a lower likelihood of negative adjustment:

- Students who score higher on the self-care scale are more likely to belong to groups than students who have low scores.
- With other factors being held constant, students with higher functional cognitive skills are more likely to belong to a group and see friends outside of groups.
- Similarly, students with high scores on the social skills scale are more likely to belong to a group and 28 percentage points more likely to see friends outside of groups. This group of students also is less likely to be the subject of disciplinary actions at school.

Demographic Characteristics

- Age is related to all three aspects of social adjustment. Holding other factors constant, older students with disabilities are more likely to belong to a group and to see friends outside of those groups than younger peers. They also are more likely to be subject to disciplinary actions at school.
- Gender also is a significant factor with respect to social adjustment. Boys with disabilities are more likely than girls to see friends outside of groups and be the subject of disciplinary actions at school; however, boys and girls are almost equally likely to belong to groups.
- African-American and Hispanic students have quite different patterns of social adjustment and both are different from their white peers. Compared with their white peers, African-American students are more likely to be the subject of disciplinary actions, and Hispanic students are 17 percentage points less likely to belong to a group. Neither group differs from white students in their probability of seeing friends regularly, and African-American students do not differ from white students in their probability of group membership.
- Students who use primarily a language other than English at home are less likely to belong to a group, but no more or less likely to see friends regularly or be the subject of disciplinary actions at school.

Household Characteristics

- Household income is related in opposite directions to two measures of social adjustment (Exhibit 5-9). The higher a student's family income, the more likely he or she is to belong to a group and the less likely to be subject to disciplinary actions at school.
- The importance of family involvement and support for their children at school is confirmed in these analyses. Family involvement at school is associated positively with both measures of positive social integration, with a

particularly strong relationship with the likelihood of students belonging to groups.

Exhibit 5-9
Differences in Measures of Social Adjustment Associated with Household Characteristics of Students with Disabilities

	Estimated Difference in Probability of:			
	Belonging to a Group	Seeing Friends Outside of Groups at Least Weekly	Receiving Disciplinary Action at School	Comparison Categories
Household income	**10.5*** **		**-1.2***	$55,000-$60,000 vs. $20,000-$24,000 (12 vs. 5)
Family involvement at home				High (8) vs. low (4)
Family involvement at school	**17.5*** **	**7.3*** **		High (6) vs. low (1)
Family expectations for postsecondary education	**8.2*** **			Definitely will vs. probably won't

[a]Statistics in this exhibit are calculated from models that included all household 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). All statistics in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.

Exhibit reads: Students with high family involvement at school are 17.5 percentage points more likely to belong to an organized group than students with low family involvement, other factors being equal. Other analysts could choose different comparisons (e.g. $30,000 to $34,000 and $40,000 to $44,000 for household income), which would result in a different estimate, but would have no effect on its statistical significance.

School Programs and Experiences

Some aspects of students' school programs and experiences have strong associations with social adjustment (Exhibit 5-10).

- Greater inclusion in general education classes is related to positive social adjustment among students with disabilities. Independent of the nature of his or her disability, level of functioning, and demographic characteristics, the greater proportion of a school day a student spends in general education classes, the more likely he or she is also to be included in extracurricular group activities.
- Receiving social adjustment supports is related to a higher likelihood of students with disabilities being subject to disciplinary actions at school, perhaps because having disciplinary problems at school results in students receiving help with social adjustment issues.
- School performance also relates to social adjustment; compared with a student who gets mostly Cs and Ds, a student who gets mostly As and Bs is less likely to be subject to disciplinary action at school.
- The negative impacts of school mobility are apparent. The more times a student has changed schools other than because of grade promotions, the more likely he or she is to be subject to disciplinary actions.

- Absenteeism and grade retention are not related to either of the two indicators of positive social adjustment or to the indicator of negative social adjustment.

Exhibit 5-10
Differences in Measures of Social Adjustment Associated with School Programs and Experiences of Students with Disabilities

	Estimated Change in Probability of:			
	Belonging to a Group	Seeing Friends Outside of Groups at Least Weekly	Receiving Disciplinary Action at School	Comparison Categories
Percentage of classes that are general academic education classes	**4.8**			75% vs. 25%
Number of social adjustment supports			**6.2*** **	Two vs. none
School mobility			**3.2*** **	Changed schools 3 times vs. not at all, except for promotions
Overall grades			**-2.1**	Mostly As and Bs vs. mostly Cs and Ds
Ever been retained at grade level				Yes vs. no
Absenteeism				5 days vs. 0 days

[a]Statistics in this exhibit are calculated from models that included all factors shown in this exhibit, as well as individual and household characteristics (results shown in Exhibits 5-8 and 5-9). All statistics in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.
Exhibit reads: Students who take 75% of their courses in general education classes are 4.8 percentage points more likely to belong to a group than students who take 25% of their courses in general education classes, other factors being equal. Students who receive two social adjustment supports are 6.2 percentage points more likely to be subject to disciplinary actions at school than students who presumably do not need and do not receive social adjustment supports. Other analysts could choose different comparisons (e.g. 60% and 40%), which would result in a different estimate, but would have no effect on its statistical significance.

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. Specifically, the PI values for the full models range from .12 to .23.[3] Individual characteristics have by far the strongest association with the various measures of social adjustment, accounting for almost 100% of the variance explained by the models related to a student seeing friends outside of organized groups and to being subject to disciplinary actions at school. Individual characteristics account for approximately 74% of the explained variation for the model related to belonging to a group and increase the PI of this model from .14 to .20. When combined with household characteristics, they account for 100% of the explained variation of the model. School characteristics and experiences variables add little explained variation to the models.

Summary

Findings in this chapter present a mixed picture of the social adjustment of students with disabilities. Many students with disabilities are reported to be quite socially well adjusted. Parents report that between one-third and one-half "very often" exhibit a variety of social skills, and most other students are reported to do so at least some of the time. The majority of students also behave well in the classroom, reportedly getting along well with their teachers and other students and controlling their behavior well. Approximately half are reported to follow directions in the classroom well. In addition, most students with disabilities are socially integrated outside the classroom; more than 80% of students get together with friends at least weekly or belong to at least one group.

However, social adjustment challenges clearly remain for some students with disabilities. According to parents, approximately one in ten students with disabilities "never" seem confident in social situations, start conversations, control their tempers 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" receive criticism well. Furthermore, approximately one in ten do not get along well with other students. Outside of school, one in five 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.

Students with learning disabilities or speech, hearing, visual, or orthopedic impairments tend to have the most positive social adjustment, according to the social skills rating scores. Students with emotional disturbances or autism tend to have the lowest social skills scale scores, and students with autism or multiple disabilities are among the least socially integrated outside the classroom. In

[3] Possible PI values range from 0 to 1 in a similar way to conventional r^2 statistics. See Appendix A for a complete description.

contrast, students with emotional disturbances see friends regularly and belong to groups, but are much more likely than any other group of students to be the subject of disciplinary actions at school.

A student's disability category is not the only factor related to his or her social adjustment. The student'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 measures of social adjustment tend to weaken somewhat. Compared with students with learning disabilities, students with emotional disturbance tend to get into more trouble at school than does any other disability group, and students with visual or orthopedic impairments or autism are the least likely to belong to a group and see friends outside of groups at least weekly.

On the other hand, higher levels of functional cognitive skills and social skills also are associated with increased probabilities of the two measures of positive social adjustment, and higher social skills are associated with decreased probabilities of receiving disciplinary actions at school. Moreover, a student with problems in more domains is less likely to see friends regularly and to get in trouble at school.

A student'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 are more likely to get into trouble. In addition, African-American students with disabilities are more likely than white students to have disciplinary problems at school, and Hispanic students are much less likely to belong to a group than their white peers. In addition, students from more affluent families are more likely to belong to a group and less likely to be the subject of disciplinary actions at school. Students whose families are involved at their schools and who have high expectations for their educational futures tend to be more socially integrated.

A student's school program and experiences have strong associations with his or her social adjustment in predictable ways. Students who change schools frequently tend to get into more trouble at school. At the same time, students who spend more time in general education classes and those who get better grades tend to be more socially integrated and get into trouble less often. Finally, students who receive more social adjustment supports are more likely to receive disciplinary actions at school, probably because poor behavior is the basis for their receipt of the supports.

6. The Emerging Independence of Elementary and Middle School Students with Disabilities

By Phyllis Levine and Renée Cameto

For the better part of the last century, children with disabilities often were sent to special residential schools (e.g., those for young people with visual or hearing impairments) or institutions that provided little in the way of educational programs (e.g., for children with significant mental retardation). Students who did attend public schools were likely to be placed in "special classes" where they were segregated from their peers without disabilities. By the latter part of the 20th century, the de-institutionalization movement, a surge in advocacy, a heightened public awareness, and the support from legislation had changed how society interacts with people with disabilities. Support is growing for the notion that all children with disabilities are capable of learning, becoming contributing citizens in the community, and living as independent a life as possible (McVilly & Rawlinson, 1998).

In recent years, this perspective has been reflected in a notable change in the way children with disabilities are viewed and treated by the adults in their lives. Increasingly and justifiably, students with disabilities are viewed as capable of growing up to determine their own futures. Students receiving special education services are being encouraged to develop decision-making and self-determination skills as early as elementary school (e.g., through games and activities that encourage making choices). Attributes of self-care and personal responsibility take on greater importance as children enter adolescence. These types of skills are essential during the middle school years, when children are forming self-identify, discovering independence, and being heavily influenced by their peers. As they move toward high school, students increasingly are expected to be able to advocate for their preferences and needs, including being part of the transition planning process, and to make personal judgments regarding their future (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 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 are expected to complete chores both at home and at school are exposed to decision-making opportunities and gain experience in personal responsibility (e.g., setting priorities, taking initiative, persisting with a task until it is completed). As the self-determination movement grows, students with disabilities are likely to gain increased functional, self-care, and household skills, and to become increasingly active in contributing to decisions as they age. These types of experiences help

students to develop a keen locus of control; that is, to recognize their own responsibility for accomplishments and disappointments (Ross & Taylor, 1989).[1]

This chapter highlights skills that support students' emerging independence, their behaviors that express that independence at home, and their general sense of their own self-efficacy, focusing on the following indicators:

- Managing self-care activities
- Using functional cognitive skills
- Getting around independently outside the home
- Persisting in completing tasks
- Self-advocating
- Taking on household responsibilities
- Evidencing a sense of locus of control.

Independence on these dimensions is described both for students 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, a measure of locus of control has been chosen for multivariate because it is a foundation for increasing independence as children age.

Dimensions of Emerging Independence of Students with Disabilities

Skills that Support Emerging Independence

SEELS has investigated the extent to which students 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.

Self-care skills. To assess the independence of students with disabilities in caring for their fundamental physical needs, their parents were asked to rate how well students can feed and dress themselves without help on a 4-point scale that ranges from "not at all well" to "very well." A summative scale of abilities ranges from 2 (both skills done "not at all well") to 8 (both skills done "very well") (Exhibit 6-1).

[1] Analyses similar to those reported in this chapter were conducted for secondary age students as part of the National Longitudinal Transition Study 2 (NLTS2) and are reported in Cameto, Levine, Wagner, & Marder, 2003.

Exhibit 6-1
Self-care Skills of Students with Disabilities

Percentage who:	
Feed themselves without help:	
Very well	89.2
Pretty well	8.5
Not very or not at all well	2.3
Dress themselves without help:	
Very well	78.0
Pretty well	16.1
Not very or not at all well	5.9
Have a self-care scale score of:	
High (8)	75.7
Medium (5 to 7)	22.4
Low (2 to 4)	1.9

Source: Wave 1 parent interviews.
Standard errors and sample sizes are in Appendix B.

- According to parents, almost 90% of students are able to feed themselves on their own "very well," and 8% do so "pretty well." Only 2% feed themselves less well.
- Fewer students (78%) can dress themselves "very well," and more than 16% can do so "pretty well." Only 6% dress themselves not very or not at all well.
- About three-fourths of students have a high self-care skills scale score; only 2% have a low score.

Functional cognitive skills. Parents were asked to evaluate their children regarding four common skills that arise in the context of daily living: 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 students with disabilities have more difficulty performing functional cognitive skills (Exhibit 6-2) than the self-care skills described above. Still, most students can competently complete these tasks.

Exhibit 6-2
Functional Cognitive Skills of Students with Disabilities

Percentage who:	
Read and understand common signs:	
Very well	70.3
Pretty well	18.3
Not very well	7.6
Not at all well	3.7
Tell time on an analog clock:	
Very well	37.5
Pretty well	32.1
Not very well	19.8
Not at all well	10.5
Count change:	
Very well	42.4
Pretty well	28.5
Not very well	21.5
Not at all well	7.6
Look up telephone numbers and use the phone:	
Very well	30.9
Pretty well	24.3
Not very well	23.0
Not at all well	21.7
Have a functional cognitive skills scale score of:	
High (15 or 16)	24.4
Medium (9 to 14)	63.6
Low (4 to 8)	12.0

Source: Wave 1 parent interviews.
Standard errors and sample sizes are in Appendix B.

- Approximately 90% of students read and understand common signs "very well" or "pretty well."
- About 70% tell time and a similar percentage count change "very well" or "pretty well."
- Looking up telephone numbers and using the telephone is the task that presents students with the greatest difficulty; 55% of students perform this task "very well" or "pretty well" according to parents.
- A summative scale of parents' ratings of students' abilities to perform these functional mental skills was created, which ranges from 4 (all skill done "not at all well") to 16 (all skills done "very well"). About one-fourth of students with disabilities score high on this scale (15 or 16), whereas 12% score at the low range (4 to 8), indicating they encounter difficulty with several of the tasks.

Mobility. As children enter the middle childhood and adolescent years, being able to go places outside the home by themselves becomes a hallmark of emerging maturity and independence. But getting around outside the home involves both cognitive and physical abilities, and this can be difficult for some students who have limitations in either or both of these areas of functioning. The ability of students to navigate the nearby environment outside their homes was assessed for students age 12 or older using parents' ratings of how well students 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 using a 4-point scale ranging from "very well" to "not at all well."

In addition, information was collected for all students identified as having a visual impairment as the primary disability classification, as reported by school districts, a disability that has particular implications for mobility. School staff who were best able to describe the overall school programs of these students were asked to report how well ("not very well," "pretty well," "very well") they are able to perform 10 mobility activities (e.g., travel indoors using remotely learned routes, execute a route given a verbal set of directions).[2] A composite mobility performance score was calculated by summing these responses, which range from a low of 10 to a maximum of 30:

- The majority of students get around in their local area "very well" (about 70%) or "pretty well" (about 11%), although 12% do not get around well on their own at all (Exhibit 6-3).

Exhibit 6-3
Mobility of Students with Disabilities

Percentage who:	
Get to places outside the home:[a]	
Very well	70.1
Pretty well	11.4
Not very well	6.6
Not at all well	11.9
Have a mobility scale score for students with visual impairments of: [b]	
High (24-30)	56.3
Medium (16-23)	32.9
Low (10-16)	10.8

[a]Source: Wave 1 parent interviews. Includes students 12 years old or older.
[b]Source: Wave 1 student's school program questionnaire.
Standard errors and sample sizes are in Appendix B.

- School staff reported that more than half (56%) of students with visual impairments perform in the high range and that another third have medium

[2] Appendix A provides the full set of these items.

mobility scores. They reported low mobility performance scores for 11% of students with visual impairments.

Self-determination skills. The road to independence for children and adolescents includes the development of self-determination skills, such as persisting with tasks to completion or advocating for oneself. To assess persistence, parents and teachers[3] were asked how often students "keep working at something until finished, even if it takes a long time." Responses included "very often," "sometimes," and "never." Self-advocacy is assessed by school staff ratings of how well a student can "ask for what he/she needs 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."

- Most students with disabilities are reported to persistent with a task "very often" (34%) or "sometimes" (50%). Sixteen percent of students reportedly "never" follow a task through to completion.
- School staff report that most students with disabilities are developing self-advocacy skills, with about one-third (33%) asking for what they need to do their best in class "very often," and almost half (49%) self-advocating "sometimes." Eighteen percent are reported to "never" ask for what they need to do their best in class.

Exhibit 6-4
Persistence and Self-advocacy Skills of Students with Disabilities

Percentage who:	
Keep working at something until finished: [a]	
Very often	34.2
Sometimes	49.9
Never	15.8
Ask for what they need to do their best in class: [a]	
Very often	33.4
Sometimes	48.5
Never	18.2

[a]Source: Wave 1 parent interviews or teacher questionnaire.
[b]Source: Wave 1 teacher questionnaire.
Standard errors and sample sizes are in Appendix B.

[3] In measuring persistence, data from teachers has been used when a parent report was missing.

Household Responsibilities

Most elementary-school-age children are expected to perform some household chores. More than 96% of this age group in the general population were reported by parents to be involved in household chores in some way (National Center for Education Statistics, 2000), and 90% of parents of students with disabilities in elementary and middle school say they have rules at home about students doing household chores. Responsibilities around the house for children can include fixing their own breakfasts or lunches, straightening up their rooms or living areas, and doing their own laundry. These kinds of daily living responsibilities can measure students' competence and growing independence.

Parents were asked how often students fix their own breakfasts or lunches, straighten up their living areas, and do their laundry (Exhibit 6-5). The frequency of performing these tasks was reported on a 4-point scale ranging from "never" to "always." Summing these values creates a scale that ranges from 3 (all activities "never" done) to 12 (all activities "always" done).

Exhibit 6-5
Household Responsibilities of Students with Disabilities

Percentage who:	
Fix their own breakfast or lunch:	
Always	17.4
Usually	17.3
Sometimes	47.9
Never	17.4
Straighten up their own room/living area:	
Always	23.3
Usually	17.0
Sometimes	45.6
Never	14.6
Do their laundry:	
Always	3.6
Usually	3.7
Sometimes	20.9
Never	71.8
Have a household responsibilities scale score of:	
High (11 or 12)	2.5
Medium (7 to 10)	37.2
Low (3 to 6)	60.3

Source: Wave 1 parent interviews.
Standard errors and sample sizes are in Appendix B.

- About 85% of students with disabilities fix their own breakfasts or lunches and straighten up their own living areas at least "sometimes," although no

more than 40% are reported to perform these household responsibilities "always" or "usually."

- Doing laundry is a much less common activity for students with disabilities in the SEELS age range; fewer than 30% ever do laundry.
- More than 60% of students score "low" on the scale of household responsibilities, indicating that they do these activities "sometimes" or "never." Only 2% are reported to do almost all the activities "always."

Locus of Control

Locus of control refers to the tendency to attribute both success and difficulties either to internal factors (e.g., one's own effort, skill, or choices) or external factors (e.g., luck or other people's decisions) (Conner, 1995). Having a strong internal locus of control enables students to link their efforts, such as studying for tests and doing homework, to outcomes and to take responsibility for the consequences of their own choices. Those who have primarily an external locus of control are less likely to seek solutions to problems because they feel they have little control over what happens to them and is a factor in "learned helplessness" (Seligman, 1975; Wortman & Brehm, 1975). Having a strong internal locus of control has been linked to greater academic success (Findley & Cooper, 1983; Kernis, 1984; Ross & Taylor, 1989) and resilience (Garmezy & Rutter, 1983).

Locus of control scores were derived from the School Attitude Measure (Wick, 1990), which is the sum of items related to students' perceptions of the cause of bad grades, how things turn out at school, whether "a student like me" can get good grades, whether the student has control over his or her grades, and whether the student knows how to be successful in school. Students rated themselves on these items on a 4-point scale that ranges from "never agree" to "always agree." The scale ranges from 5 to 20, but actual scores fall between 8.6 and 12.3, with a mean of 10.

- Students with disabilities have self-reported locus of control scores that span a wide range. Almost one-fourth (23%) of students report very high internal locus of control, indicating that they believe that they have personal influence over the grades they receive and the success they achieve in school more generally. Almost one-fifth (19%) report high internal locus of control.
- In contrast, about one-third of students with disabilities report a moderate level of internal locus of control, and 1 in 4 indicate they do not feel they have such control and are unsure of how to do better in school.

Disability Differences in Emerging Independence

Students with different primary disability classifications differ dramatically in the extent to which they demonstrate skills and behaviors that indicate emerging independence (Exhibit 6-6).

- Larger proportions of students in all disability categories perform self-care skills with "high" ability than perform functional cognitive skills at that level.
- Dressing and feeding themselves are still difficult tasks for some students. Only among students with learning disabilities or speech or hearing impairments do more than three-fourths of students perform both tasks "very well"; 2% or fewer of these students reportedly have difficulty with either activity. In contrast, more than one in five students with multiple disabilities score in the low range on the self-care scale.
- In six disability categories, the proportion of students performing functional mental skills with high ability exceeds 20%: learning disability; emotional disturbance; and speech, hearing, orthopedic, and other health impairments. Even in these categories, however, from 7% to 22% of students score in the low range on the functional mental skills scale. Among students with mental retardation, autism, and multiple disabilities, from 40% to 51% of students score in the low range on the functional cognitive skills scale, as do almost 30% of students with visual impairments or traumatic brain injuries. In these categories, from 6% to 16% of students perform functional cognitive skills with high ability.
- A high level of mobility is reported for 70% to 80% of students with other health impairments, learning disabilities, or speech impairments. In contrast, from 28% to 34% of students with autism, visual impairments, or multiple disabilities manage to get around outside the house very well. However, about one-third of students with autism or multiple disabilities and about one-quarter of students with orthopedic or visual impairments are reported to get around outside the house "not at all well" on their own.
- Although the frequency of students exhibiting persistence and self-advocacy varies across disability categories, the ranges for students who do these "very often" is narrower than they are for mobility (24% to 42% for persistence and 15% to 40% for self-advocacy vs. 28% to 80% for mobility).

Exhibit 6-6
Skills and Behaviors that Support Emerging Independence, 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
Percentage who:											
Have a self-care skills scale score of: [a]											
High (8)	81.2	85.6	54.4	64.7	77.1	45.1	34.4	60.0	33.0	44.2	31.6
Medium (5 to 7)	18.4	14.2	39.4	33.0	21.3	44.7	47.8	36.8	58.8	43.9	47.6
Low (2 to 4)	.4	.2	6.2	2.3	1.6	10.2	17.8	3.2	8.2	11.9	20.8
Have a functional cognitive skills scale score of: [a]											
High (15 or 16)	23.3	31.8	6.2	27.0	22.9	15.9	21.4	28.1	9.1	10.6	9.0
Medium (9 to 14)	69.9	61.7	53.7	62.7	66.1	56.8	56.8	58.3	47.9	61.4	40.0
Low (4 to 8)	6.8	6.5	40.1	10.3	11.0	27.3	21.8	13.6	43.0	28.0	51.0
Get around outside the house[a, b]											
Very well	75.0	69.9	50.0	67.0	66.8	31.3	49.3	80.1	28.1	58.1	34.4
Not at all well	10.9	13.1	16.4	10.2	9.1	22.4	24.3	3.1	34.2	9.8	34.9
Keep working at something until finished[c]											
Very often	33.2	40.8	29.1	23.4	42.0	38.0	33.3	23.6	26.2	27.8	27.9
Sometimes	50.9	48.8	48.0	51.5	48.4	45.8	50.6	54.0	51.8	44.4	47.4
Never	15.9	10.4	22.9	25.1	9.6	16.2	16.1	22.4	22.0	27.8	24.7
Ask for what they need to do their best in class[d]											
Very often	33.4	39.2	29.1	19.6	35.5	33.6	35.7	25.4	14.7	31.2	26.7
Sometimes	48.8	46.0	51.7	57.7	46.6	48.2	44.3	49.2	48.4	50.0	42.5
Never	17.8	14.8	19.2	22.7	17.9	18.2	20.0	25.4	36.9	18.8	30.8
Have a household responsibilities scale score of:[a]											
High (15 or 16)	3.8	1.7	1.4	1.2	1.8	1.1	0.5	2.1	0.1	1.2	1.3
Medium (9 to 14)	41.1	39.3	29.6	31.9	42.3	32.1	21.4	28.8	14.8	28.6	18.7
Low (4 to 8)	55.1	59.0	69.0	66.9	55.9	66.8	78.1	69.1	85.1	70.2	80.0
Have a locus of control score of:[e, f]											
Very high	19.1	27.1	13.0	24.7	23.8	33.9	25.1	30.7	28.9	16.7	28.5
Low	30.1	22.6	42.4	23.7	19.6	19.7	26.5	18.6	22.5	40.8	28.1

[a]Source: Wave 1 parent interviews.
[b]The categories "well" and "not very well" are omitted from the exhibit.
[c]Source: Wave 1 parent interviews or teacher questionnaire.
[d]Source: Wave 1 teacher questionnaire.
[e]Source: Wave 1 direct assessment.
[f]The categories "high" and "medium" are omitted from the exhibit.
Standard errors and sample sizes are in Appendix B.

- Fewer than one-quarter of students with emotional disturbances or other health impairments are considered persistent by their parents, and although 20% to 25% ask for what they need "very often," another one-quarter of each group are reported by their teachers "never" to self-advocate.
- Only students with autism or multiple disabilities are reported "never" to self-advocate in higher proportions (37% and 31%, respectively) than students with other health impairments or emotional disturbances.
- Students with speech, hearing, or visual impairments are reported to be most persistent (41%, 42%, and 38%, respectively, "very often" keep at tasks). When it comes to asking for what they need, students with speech, hearing, or orthopedic impairments are most likely to do so "very often" (39%, 35%, and 36%. respectively).
- More than half of the students in each disability category score low on the household responsibilities scale, although there are fewer students with learning disabilities or speech or hearing impairments at the low end of the scale than students in other categories. More than three-fourths of students with orthopedic impairments, autism, or multiple disabilities score low on the household responsibilities scale.
- Students with visual impairments or other health impairments are the most likely to report high levels of locus of control (34% and 31%, respectively), whereas students with mental retardation or traumatic brain injuries are the most likely to report low levels of control over their success in school (42% and 41%).
- Students with speech impairments are reported to perform consistently the highest across most dimensions of independence.

Factors Related to Locus of Control among Students with Disabilities

Because a strong internal locus of control—a belief that one's own actions matter—is an important foundation for independence, it was chosen for more in-depth analysis. A multivariate analysis was performed to identify the independent relationships of a number of factors that may help explain variation in students' locus of control in an educational setting. The factors are in three domains: individual characteristics, family characteristics, and school programs and experiences.

Individual Characteristics

The relationship of three kinds of individual characteristics—disability, functioning, and demographics—are considered as they relate to locus of control (Exhibit 6-7).

Exhibit 6-7
Differences in Locus of Control Associated with Individual Characteristics of Students with Disabilities

	Estimated Difference in Locus of Control Scale Score[a]	Comparison Categories
Disability characteristics		
Students classified with:		
Speech impairment		vs. learning disability[b]
Mental retardation		vs. learning disability
Emotional disturbance		vs. learning disability
Hearing impairment		vs. learning disability
Visual impairment	**.2**	vs. learning disability
Orthopedic impairment		vs. learning disability
Other health impairment		vs. learning disability
Autism		vs. learning disability
Traumatic brain injury		vs. learning disability
Multiple disabilities/deaf-blindness		vs. learning disability
Attention deficit/hyperactivity disorder (ADD/ADHD)		Yes vs. no
Age at identification		8 vs. 4 years
Number of problem domains		Three vs. one domain
Functioning		
Self-care skills for students with:		
Low cognitive skills		High vs. low (8 vs. 4)
Average cognitive skills	**-.7*** **	High vs. low (8 vs. 4)
High cognitive skills	**-.3**	High vs. low (8 vs. 4)
Functional cognitive skills for students with:		
Low self-care skills	**1.2*** **	High vs. low (15 vs. 7)
Average self-care skills		High vs. low (15 vs. 7)
High self-care skills	**.3**	High vs. low (15 vs. 7)
Social skills		High vs. low (27 vs. 17)
Persistence		High vs. low (3 vs. 1)
Demographics		
Age		12 vs. 9 years
Gender	**.1**	Male vs. female
African-American		vs. white
Hispanic		vs. white
Other or multiple race/ethnicity		vs. white
Primarily uses language other than English at home		Yes vs. no

[a]Statistics in this exhibit are calculated from models that include all individual characteristics shown in this exhibit, as well as household characteristics (results shown in Exhibit 6-8) and school programs and experiences (results shown in Exhibit 6-9). All statistics in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.
bMultivariate 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. Similarly, white is used as the reference group for ethnicity because it is the largest.
[d]ADD/ADHD is included to determine its relationships as a primary or secondary disability to academic performance, independent of youth's primary disability category.
Exhibit reads: The locus of control scale score of students with visual impairments is .2 point higher than the scores of students with learning disabilities, other factors being equal. The scale score of boys is .1 point higher than the scores of girls, other differences held constant. Other analysts could choose different comparisons, which would result in a different estimate, but would have no effect on its statistical significance.

Disability characteristics. Disability characteristics include the primary disability category of the students, whether they have ADD/ADHD, the age at which they first were diagnosed with a disability or learning problem, and the number of domains in which the experience limitation.

- Controlling for other factors, the disability category and other disability-related characteristics generally are not related to the level of locus of control for elementary and middle school students with disabilities.
- Only students with visual impairments differ on the locus of control scale from students with learning disabilities, and the difference is modest. Relative to students with learning disabilities and with other factors held constant, having a visual impairment is associated with having a high locus of control in an educational setting with a score difference of .2, indicating that students with visual impairments perceive themselves to be in control of their educational experiences to a greater degree than students with learning disabilities.

Functioning. Characteristics associated with individual functioning include self-care, functional cognitive skills, social skills, and persistence.

- Self-care and functional cognitive skills are related to locus of control. However, there is an interaction between student self-care scores and functional cognitive scores as they relate to locus of control. The difference in locus of control between students with differing self-care scores depends in part on their cognitive functioning. The relationship between locus of control and self-care skill is negative for students with average to high functional cognitive skills. Among students with average to high functional cognitive skills, locus of control is high despite low self-care skills. Accenting the relationship of cognitive function to locus of control, the relationship between locus of control and students' scores on cognitive skills is strongly positive, even when self-care skills are low. High cognitive skills are associated with higher locus of control scores of 36 percentage points.

Demographic characteristics. Gender is the only demographic characteristic that is related to students' locus of control in an educational setting. Boys are more likely to score higher on the locus of control scale by about .1 points than girls, indicating boys are more likely than girls to see themselves in control of their learning experiences and activities and the grades they receive.

Household Characteristics

Various aspects of students' households were investigated to determine their relationship to locus of control. The household characteristics investigated included income, family involvement in the home and at school, and the families' expectations for students to eventually live away from home (Exhibit 6-8):

- Household income is modestly associated with students' locus of control. Controlling for other differences, students from higher income families are

more likely than those from lower income families to have slightly higher locus of control scores (3 percentage points).

Exhibit 6-8
Difference in Locus of Control Associated with Household Characteristics of Students with Disabilities

	Estimated Difference in Locus of Control Scale Score[a]	Comparison Categories
Household income	**.1**	$55,000 to $60,000 vs. $20,000 to $25,000
Family involvement at home		High vs. low (8 vs. 5)
Family involvement at school		High vs. low (6 vs. 1)
Expectations for independent living		Definitely will vs. probably won't (4 vs. 2)

[a]Statistics in this exhibit are calculated from models that include all household characteristics shown in this exhibit, as well as individual characteristics (results shown in Exhibit 6-7) and school programs and experiences (results shown in Exhibit 6-9). All statistics in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.
Exhibit reads: The locus of control scale score of students from higher income homes is .1 point higher than the score of students in lower income homes, other differences held constant. Other analysts could choose different comparisons (e.g.,. $30,000 to $34,000 and $40,000 to $44,000), which would result in a different estimate, but would have no effect on its statistical significance.

School Programs and Experiences

SEELS analyses considered the relationship of the school programs and experiences of students with disabilities and their locus of control. The specific school factors believed to have potential for being related to locus of control are the percentage of time spent in general education, the number of modifications to tests, the number of presentation or communication aids, and the number of social adjustment supports students have. Other school experiences, such as the number of days students are absent from school, whether they have been held back a grade in the last 3 years, and how often they have changed schools were considered as well (Exhibit 6-9).

- Only two of the seven measures of school programs and experiences have strong associations with students' locus of control—modifications to tests and grade retention.

Exhibit 6-9
Differences in Measures of Locus of Control Associated with School Programs and Experiences of Students with Disabilities

	Estimated Difference in Locus of Control Scale Score[a]	Comparison Categories
School Programs		
Percentage of classes in general education		75% vs. 25%
Number of modifications to tests	**-.1**	Seven vs. one
Number of presentation/communication aids		Five vs. none
Number of social adjustment supports		Two vs. none
Other School Experiences		
Absenteeism		
Retention at grade level	**-.1**	Yes vs. no
School mobility		Three school changes vs. none, other than for grade promotions

[a]Statistics in this exhibit are calculated from models that include all household characteristics shown in this exhibit, as well as individual characteristics (results shown in Exhibit 6-7) and household characteristics (results shown in Exhibit 6-8). All statistics in the exhibit are statistically significant at at least the p<.05 level; those with asterisks are significant at the p<.001 level.
Exhibit reads: The locus of control scale score of students who receive seven accommodations is .1 point lower than the score of students who receive one, other differences held constant. Other analysts could choose different comparisons (e.g., three and six accommodations), which would result in a different estimate, but would have no effect on its statistical significance.

- With other factors held constant, the number of modifications to tests is negatively associated with locus of control. That is, students who need and receive more modifications or accommodations in testing are more likely to score lower on locus of control by about .1 point.
- Students who have been retained at grade level tend to have lower locus of control scores, also by about .1 point, when other factors are held constant.

How Much is Explained?

The factors related to locus of control investigated in the multivariate analysis explain a total of 10% of the variation (r^2=.10). The individual characteristics of students with disabilities explain almost all of the variation, with family characteristics and school programs and experiences each contributing a single percentage point to the total explained variation.

Summary

SEELS has investigated a variety of factors affecting the emerging independence of elementary and middle school students with disabilities, including skills that support and strengthen self-reliance, responsibilities that accompany an independent lifestyle, and activities associated with a growing sense of control.

Students are in the process of acquiring skills to support independence, including those involving self-care, cognitive processing of information, mobility, and persistence. About three-fourths of students with disabilities have high self-care skills, and about one-fourth have high functional cognitive skills. Only a small share of students with disabilities do poorly with regard to these skills.

The vast majority of students get around on their own in their local areas. In addition, the self-determination skills involving persistence and asking for what they need are demonstrated by more than half of students with disabilities. Among their peers with disabilities, students with speech, hearing, or visual impairments are most persistent, and students with speech, hearing, or orthopedic impairments have the highest self-advocacy ratings. Overall, students with speech impairments are reported to be performing consistently the highest across the dimensions of independence.

Assuming responsibilities of daily living is often an expectation of students as they mature. SEELS investigated the extent to which students with disabilities have become responsible for a variety of tasks in the home. About one-third of students with disabilities usually prepare their own breakfasts and lunches, and 40% straighten their rooms or living areas, demonstrating emerging independence in contributing to household responsibilities.

Although high proportions of students with emotional disturbances or other health impairments are competent in getting around the community, these students are among the lowest performers with regard to sticking with tasks to completion or advocating for themselves. The deficits in social judgment or impulsive behaviors that sometimes are associated with these disability categories may impair the students' ability to persist or self-advocate.

The relationship of some of these factors to locus of control for students with disabilities has been investigated. Although only 10% of the variation can be explained by the factors investigated, it is clear that the greatest effects on students' locus of control are their individual characteristics and capabilities. The specific nature of their cognitive functional skills is the most strongly related of these factors to the locus of control measure.

7. Students with Disabilities in Elementary and Middle School: Progress among Challenges

By Jose Blackorby and Mary Wagner

This report addresses the question of how students with disabilities are doing in their elementary and middle school years. That time is a period of rapid development for students, encompassing the beginning of the process of formal education to preparing for the demands of high school and adolescence. In important ways, these years provide the formative experiences and the skills that will contribute to students' success later. It is also during this time when intervention to address problems is believed to have the greatest likelihood of success in mitigating the extent and effects of problems. This chapter summarizes how young students with disabilities are doing across a range of outcomes, including school engagement, academic performance, social adjustment, and emerging independence. Important differences in these outcomes for students who differ in their primary disability classification are noted. A look across outcome domains then identifies aspects of individual students, their households, and their school programs and experiences that relate to the outcomes they achieve. Finally, implications are drawn for the policies, practices, and programs that affect the lives of students with disabilities in their elementary and middle school years.

Students Outcomes—Making Progress or Falling Behind?

The question of whether elementary and middle school-age students with disabilities are making progress or falling behind is difficult to answer with a single statement. There are indications of both real achievement and causes for concern across the outcome domains of school engagement, academic performance, social adjustment, and emerging independence.

A look at the lives of students with disabilities at school reveals that most students with disabilities like school, and at least half describe themselves as highly motivated and are rated by their teachers to be highly engaged in their education. Further, according to parents, many students are doing well in school, as measured by teacher-given grades. Almost one-third are reported to receive "mostly As and Bs," and only 4% reportedly receive "mostly Ds or Fs." At the same time, standardized test scores of student skills in reading and in mathematics illustrate considerable diversity in student performance; some students receive scores comparable to their general education peers, but scores below the 25th percentile are common for many more students with disabilities. Similarly, teacher reports of reading and mathematics abilities for students with disabilities show them often to be more than 1 to 2 years behind grade level, on average, in both their reading and mathematics abilities. These skill deficits in

core academic subjects do not bode well, given that students will encounter increasingly difficult content as they move on to secondary school and beyond.

In the social domain, students with disabilities also are considered to be fairly skilled, 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 students 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, almost 20% of students have neither of these forms of social engagement outside of class. More than a third of students with disabilities were subject to disciplinary actions at school in the 2000-01 school year even though parents report that 90% of them get along with other students and 50% have teachers who report they follow directions in class.

Students 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." The vast majority of students with disabilities are able to manage their personal care needs, and parents report about half are 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 students with disabilities.

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

With respect to academics, as a group, students with disabilities' standardized test scores place most of them in the lowest quartile in comparison with the norm group. Although certainly low, these scores illustrate in part the implications of disability in academic tasks and the need for specialized education. However, students in different disability categories compare with general education peers quite differently. Students with visual or speech impairments have test score patterns that resemble those of the general population, particularly in mathematics. On the other hand, students with mental retardation, autism, or multiple disabilities have test scores that overwhelmingly cluster at the low end of the range.

In the social domain, although most students with disabilities have relatively good social skills, they still rank lower than students in the general population on many of the measures, which is a cause for concern. Although their relative skills deficit does not appear to relate to lower levels of organized group memberships, it raises the question of whether the negative implications of poor social skills will accumulate as students with disabilities age.

From this summary of the outcomes of students with disabilities, it is clear that their achievements are exemplified by diversity across domains and across students.

What Makes a Difference?

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

Disability and Functioning

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

- Relative to students with learning disabilities, those with visual impairments experience more positive outcomes at school, with higher locus of control and standardized test scores in reading and mathematics, but more negative social outcomes in terms of having friends and belonging to groups, apart from other differences between students.
- Like students with visual impairments, those with orthopedic impairments generally succeed better at school, relative to those with learning disabilities, but they have less social involvement with extracurricular groups and friends.
- Students with emotional disturbances tend to have higher test scores but lower grades than students with learning disabilities, other factors held constant, and they are equally likely to have active friendships and group memberships. However, they are much more likely to experience negative consequences for behavior at school in terms of disciplinary actions.
- Students with mental retardation have 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 the cognitive nature of the disability is reflected in their reading and mathematics skills, which are significantly farther behind grade level than students with learning disabilities. However, there are no significant differences in grades related to having mental retardation vs. a learning disability, independent of other differences in functioning among students or their placements in general education settings.

SEELS also has investigated the independent relationships between outcomes and having attention deficit or attention deficit/hyperactivity disorder (ADD/ADHD). Apart from other differences among students in their disability, functioning, or other characteristics, having ADD/ADHD 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 performance; students whose parents report that have that disorder are no more or less behind in reading or mathematics than students who do not. In fact, having ADD/ADHD is positively associated with some social outcomes; students with ADD/ADHD are more active than others in extracurricular groups.

Two other characteristics of disability have also been considered in SEELS multivariate analyses. The number of areas in which students experience functional limitations and the age when their disabilities first were diagnosed were considered proxies for the breadth or severity of students' disabilities, and were expected to show similar relationships with poorer outcomes.

The breadth of disability, in terms of the number of areas (e.g., use of appendages, hearing, vision, communication) in which students have functional limitations is related to five outcomes and age of identification relates to three indicators. For example, dealing with the consequences of disability from an early age is related to higher classroom engagement in general education, higher motivation for schooling, and higher grades, but lower test scores in reading. Similarly, having functional limitations in more areas is associated with higher motivation for schooling and a lower likelihood of disciplinary actions, but also with seeing friends less frequently. 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 students' functional abilities could be expected to relate in similar ways to outcomes, with higher skills being consistently associated with better outcomes. However, as was the case above, SEELS analyses show that different kinds of skills relate differently across the outcome domains in terms both of intensity and of relationship direction. For example:

- Higher functional cognitive skills are, surprisingly, not related to better school engagement. It is, however, strongly associated with higher academic achievement in both reading and mathematics, as expected. The amount of increased academic performance associated with higher cognitive skills is conditioned by student self-care skills. The difference between high and low cognitive skills among students with high self-care skills is large (about 17 points). However, the difference is three times that size among students with low self-care skills. This pattern exists in the domain of locus of control as well. Finally, higher functional cognitive skills also relate to a higher likelihood of group membership and active friendships.
- Although disabilities that limit students in managing basic self-care needs might be assumed to have fairly pervasive and negative affects on outcomes,

SEELS analyses only partially support that conclusion. Relatively poorer self-care skills are associated with higher absenteeism, independent of other differences among students. However, in the case of academics, the difference between having high and low self-care skills is conditioned by students' cognitive skills. For students with high cognitive skills, having higher self-care skills is actually negative and fairly large. In contrast, among students with low cognitive skills, increased self-care skills are positively associated with academic performance.

- Being more socially skilled would be expected to relate to better social adjustment outcomes, and it does in some respects. Students with higher social skills ratings by parents are significantly more likely to belong to groups and see friends regularly and are less likely to be subject to disciplinary actions, other factors held constant. Students with higher social skills also are absent more and have lower test scores in reading, but they have higher grades, reinforcing the notion that grades reflect more than academic ability.
- The ability to persist with tasks to completion has beneficial effects for students in school. Those rated as more persistent by parents also exhibit more engagement in classroom activities and receive better grades than less persistent peers, other things being equal. This self-determination skill does not relate to academic abilities in reading and mathematics, apart from other differences among students.

Students' general health. This aspect of functioning is included in analyses of absenteeism and demonstrates one of the strongest relationships to that indicator of engagement of any factor. The strong relationship between health and absenteeism underscores the fact that absenteeism from school can be both voluntary and involuntary.

Taken together, these aspects of students' disability and functioning explain much of the variance in the outcomes assessed, although that is more the case for some outcome domains (e.g., independence) than others (e.g., academic performance). Yet characteristics of students 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 are typically examined in studying student outcomes in the general population, such as age, gender, and race/ethnicity, are intertwined with issues of disability (Wagner, Marder, Blackorby & Cardoso, 2002). For example, students with speech impairments tend to be younger and students with emotional disturbances older than those in most other disability categories. Boys make up much larger proportions of students with emotional disturbances or autism than those with other disabilities. African-Americans are disproportionately represented among students with mental retardation or emotional disturbances. For these reasons, simple bivariate descriptions of outcomes for students 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 these attributes that contributes to differences in the outcomes observed. Multivariate analyses permit a disentangling of these factors by identifying their independent relationships with outcomes, holding constant disability and other factors in the analyses.

Age. Even when students with disabilities are in the comparatively young 6-to-13-year-old[1] age range, relative differences in age relate to some aspects of their outcomes, but in different ways and possibly for different reasons. For example, older students with disabilities exhibit a pattern of results indicating greater difficulty in several domains. Older students are less motivated and are more likely to receive disciplinary actions than younger peers. Analyses also reveal that older students tend to be further behind in their reading and mathematics abilities and have lower test scores, which may suggest that the skills of students with disabilities do not develop at the same rate as those of students in the general population, so that, with the passage of time, they fall farther behind. In the social domain, older students are more likely to belong to groups, but are less likely to spend time with friends regularly.

Gender. SEELS analyses illustrate a number of differences in several outcome domains between boys and girls. Boys experience greater challenges in engagement and social adjustment at school, whereas girls have more difficulty in mathematics. Independent of other differences, boys with disabilities are more frequently absent and subject to disciplinary actions and have poorer classroom engagement behaviors in special education. On the other hand, boys also are more motivated for school than girls and more likely to see friends frequently. Girls are both further from grade level in mathematics and have lower test scores in mathematics calculation than boys.

Race/ethnicity. Not only is race/ethnicity intertwined with disability in that students of different racial/ethnic backgrounds are differentially represented across disability categories, it also is inextricably linked with household income. For example, the likelihood of students with disabilities living in poverty is almost three times as high for students with disabilities who are African-American (51%) or Hispanic (41%) than white (14%; Wagner, Marder, & Cardoso, 2002). In addition, both students of color with disabilities and those from lower-income households experience other conditions 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 a relatively small number of student outcomes, irrespective of disability, income, and other differences between students. Compared with white students with disabilities, both African-American and Hispanic students have higher scores for motivation for schooling. However, the outcome patterns of these two groups diverge in

[1] Students were ages 6 through 13 when Wave 1 parent interview data were collected and 7 through 14 when Wave 1 school questionnaires were distributed.

other areas. Relative to white students with disabilities, African-Americans are further from grade level in mathematics and are more likely to be subject to disciplinary actions at school than white students with disabilities. In contrast, Hispanic students with disabilities tend to be less likely to participate in organized group activities than white students, independent of income and other differences between them. These different patterns of experiences for African-American and Hispanic students with disabilities caution against considering "minority students" or "students of color" as a single group in assessing their outcomes relative to white students.

Primary language. Independent of racial/ethnic differences among students with disabilities, using a language other than English at home does not appear to relate to students' outcomes, with one exception: relative to those who primarily use English at home and irrespective of other differences between them, students with disabilities who primarily use a language other than English at home are less likely to belong to a group.

Household Characteristics

The household context in which students with disabilities live can be expected to help shape their experiences across outcome domains. SEELS analyses included three aspects of students' household environments in analyses of outcomes: household income, levels of family support for education at home and at school, and parents' expectations for the futures of their adolescent children with disabilities.

Household income. As mentioned above, students with disabilities are more likely to live in low-income households than students in the general population. In addition, SEELS analyses show a pattern of less positive outcomes for low-income students, holding constant other factors. These findings may help explain some of the difference in some outcomes between students with disabilities and those in the general population, apart from differences related to disability. Regarding school engagement, students with disabilities from lower-income households are more likely to be absent from school and are less likely to demonstrate behaviors that indicate engagement in general education and to have a high locus of control scores. Their academic performance is poorer as well; they have lower standardized test scores in reading, are farther behind grade level in reading and mathematics, and are more likely to receive poor grades. In the domain of social engagement, students from lower-income households are less likely to take part in organized group activities and are more likely to be subject to disciplinary actions at school.

Family support for education. Families of students 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 students in the general population. For example, only 2% of parents of elementary and middle-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 students with disabilities.

Students 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, benefit from that support, or from other activities associated with it, in several ways. Those students have better grades than students with less family involvement at school. They also tend to be actively involved in organized groups (many of which are at school) and have active individual friendships. In contrast, family support for education at home (i.e., talking regularly about school and helping with homework, providing a computer for school work) is not related to many outcomes, controlling for other differences among students. The exception is that greater family support for education at home is actually negatively associated with grades, possibly because parents are more likely to provide homework help when students 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. It is clear that the expectations 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, SEELS findings suggest that irrespective of the nature of students' disabilities and their levels of functioning, family expectations for the future also help shape the achievements of students with disabilities.

Other things being equal, students with disabilities whose parents expect that they are more likely to go on to postsecondary education after high school have higher grades, as well as higher test scores in reading than students whose parents do not share that optimism for the future. They are closer to grade level in their reading and mathematics abilities than students who are not expected to further their educations after high school. Students with disabilities whose parents hold high expectations for educational achievement also are more likely to affiliate with organized groups, many of which may be sponsored by or meet at school.

School Programs

Although individual and household factors contribute to shape outcomes for students with disabilities, schools do make a difference for students, particularly in the realm in which they are active partners—school engagement and academic performance. Course taking, curricula, instruction, services, accommodations, supports, and other experiences of students with schooling all figure into their engagement and performance. In fact, SEELS multivariate analyses have explained the most variance in the most direct measure of student learning analyzed in SEELS—test scores from Woodcock-Johnson III (WJIII)—explaining about 25% of the variation in both reading and mathematics performance. What schools do can matter for students with disabilities.

Enrollment in general education courses. Overall, students with disabilities who spend more of their time in general education classes differ in

many aspects of their disabilities from students whose course taking emphasizes those in special education settings. Therefore, to identify the associations of general education course enrollment on outcomes, differences in the disability and functioning of students in different settings must be held constant. SEELS multivariate analyses provide those statistical controls. Controlling for differences in 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 students with disabilities at school.

Students with disabilities who spend more time in general education classes tend to be absent fewer days from school, are closer to grade level in their reading and mathematics abilities, and have higher test scores in those areas than students who spend less time in general education courses, irrespective of other differences between the two groups. Outside of class, students appear to accrue benefits in terms of a higher likelihood of taking part in extracurricular group activities at school or in the community.

Class size. SEELS findings offer mixed support for the notion that smaller classes facilitate student learning. Students with disabilities in larger classes have lower grades but tend to be closer to grade level in their reading and mathematics abilities than students who are in smaller classes, irrespective of other differences in their school programs or disability, functioning, demographic, or household characteristics. On the other hand, in special education language arts settings, students in larger classes have lower engagement scores.

Other services, accommodations, and supports. Results of SEELS multivariate analyses illustrate the difficulty of identifying benefits that may accrue from receiving services, accommodations, or supports while students are receiving them. Students with disabilities are provided services (e.g., tutors, 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, accommodations, or supports is measured at the same time as the outcomes on which students perform poorly enough to qualify for them, a negative relationship between interventions and outcomes can occur. These negative relationships are found in SEELS 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 having poorer classroom engagement behaviors in general education, having lower locus of control scores, and being farther behind grade level in both reading and mathematics, as well as having lower test scores. On the other hand, receiving a variety of social adjustment supports is related to lower classroom engagement ratings in both general and special education and a higher likelihood of being subject to

disciplinary actions, but also to being closer to grade level in reading and mathematics.

Receiving help from a tutor is unrelated to grades or reading or mathematics performance, compared with students with disabilities who do not receive tutoring support. This 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, SEELS 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 SEELS data will permit the longitudinal analysis that is more appropriate to the question of intervention effectiveness.

Curriculum modification. Like some other accommodations, modifications made to the content or presentation format of curricula represent another mechanism to individualize instructional materials for students with disabilities. These changes relate to student outcomes in the same way as other accommodations. The need for and receipt of greater modification are associated with being less engaged in special education classes and further from grade level in reading, and having lower test scores.

Instructional grouping and classroom activities. In addition to curriculum and supports, the organization and specific types of classroom activities play direct roles in students' day-to-day experiences and relate to several outcome domains. The frequent application of both whole-class and small-group instruction is associated with improved classroom engagement scores in special education and higher motivation for schooling. On the other hand, students who receive frequent individual instruction from a teacher have lower classroom engagement in general education settings and lower test scores in reading than peers who receive less individual attention. Frequent participation in activities related to literature (e.g., reading literature, writing) is associated with higher classroom engagement in both general and special education language arts classes. It also is associated with better performance in mathematics and reading in terms of performing closer to grade level and earning higher scores on WJIII. Participation in general class activities (e.g., class discussions) also is related to positive outcomes in these areas, with the exception of mathematics calculation scores. Students whose programs frequently focus on developing phonetic or vocabulary skills have improved engagement in both general and special education classes but do not differ in academic measures from students whose programs emphasize these skills less, other differences between them held constant.

School-Related Experiences

SEELS analyses demonstrate that school experiences beyond courses, programs, and services affect students' outcomes both in and out of school.

Absenteeism. Missing school can exact 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 general education classroom settings. Students who miss a good deal of school receive poorer grades than students whose attendance is better. Higher absenteeism is not, however, associated with lower test scores.

School mobility. Moving from one school to another frequently also contributes to a cluster of school outcomes that do not bode well for students' success. Other factors held constant, students with disabilities who have changed schools often, other than for grade promotion, exhibit lower classroom engagement in general education and lower motivation for schooling than students whose school affiliations have been more stable. Although SEELS analyses show no direct independent relationship between high school mobility and indicators of academic performance, mobility is associated with a higher likelihood of being subject to disciplinary actions at school.

Grades and grade retention. SEELS analyses contribute to the debate over the value of having poorly performing students repeat grades, with findings that students 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; their absenteeism is not significantly higher, nor do teachers assess their classroom engagement behaviors differently from other students, independent of other factors in the analyses. Neither are there independent effects of being retained on students' social adjustment. However, students who have been held back because of poor academic performance in the past continue to receive lower grades and have lower locus of control scores, but are closer to grade level in reading and mathematics, other factors held constant. The effects of lower grades are felt in other domains as well. Controlling for other factors, students who receive lower grades have lower classroom engagement scores across settings and also are subject to more frequent disciplinary actions.

Clusters of Factors that Make a Difference

This summary of the results of multivariate analyses of outcomes of students with disabilities has identified the independent effects of many aspects of the students, 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 students, resulting in additive effects that distinguish students to a greater extent than is revealed by looking at factors independently. For example, we know that a student with emotional disturbance is more likely than students in many other categories to be male, African-American, and from a lower income household. This student also is likely to spend much of the school day in general education classes and receive a

variety of social adjustment supports. In contrast, a student with visual impairment is more likely to be female, white, and affluent. Like the student with emotional disturbance, this student with visual impairment also spends a high percentage of the school day in general education classes; both receive accommodations and supports appropriate to their disability.

These combinations of differences between these two hypothetical students add up to a dramatically different picture across outcome domains. Compared with other students with disabilities, both of these students would be doing comparatively well academically. They would both be less than a year behind grade level in reading and in mathematics. The girl with visual impairment, however, would have higher tests scores by 10 and 4 standard score points in reading and mathematics, respectively. In the social adjustment domain, the pattern of results would differ dramatically. For example, the probability of the boy with an emotional disturbance being subject to disciplinary actions at school would be 53 percentage points greater than for the girl with a visual impairment. The boy with the emotional disturbance would be 14 percentage points more likely to see friends regularly but 7 percentage points less likely to belong to a group. These differences reinforce the importance of considering the entirety of students' characteristics, background, and experiences in considering the relationships, instructions, services, and supports that will best help them succeed.

Opportunities and Challenges

This report provides the most thorough examination to date of the achievements of students with disabilities during their elementary and middle school years across the outcome domains of school engagement, academic performance, social adjustment, and independence. It shows diversity both within and across those domains. In some areas, such as social development and engagement in school, many students with disabilities are making progress. In others, such as academics, there is room and need for improvement. Much work remains to be done. However, the analyses of school experience factors associated with more positive outcomes highlight the myriad ways in which those factors can combine to help shape the achievements of students with disabilities and underscore the importance of maintaining individualized school programs and services as the central tenet in the education of all students.

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Appendix A
SEELS SAMPLING, DATA COLLECTION, AND ANALYSIS PROCEDURES: WAVE 1

This appendix describes several aspects of the SEELS methodology relevant to the Wave 1 parent interview/survey, including:

- Sampling local education agencies (LEAs), schools, and students
- Parent interview and survey procedures and response rates
- Weighting of the parent interview/survey data
- Estimating and using standard errors
- Calculating statistical significance
- Measurement issues.

SEELS Sample Overview

The SEELS sample was constructed in two stages. A sample of 1,124 LEAs was selected randomly from the universe of approximately 14,000 LEAs that serve students receiving special education in at least one grade from first to seventh grade.[1] These districts and 77 state-supported special schools that serve primarily students with hearing and vision impairments and multiple disabilities were invited to participate in the study. A total of 245 LEAs and 32 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 receiving special education from each LEA[2] and special school was stratified by disability category. Students then were randomly selected from each disability category. Sampling fractions were calculated that would produce enough students in each category so that, in the final study year, we can generalize to most categories individually with an acceptable level of precision, accounting for attrition and for response rates to both the parent interview and the direct assessment. A total of 11,512 students were selected and eligible to participate in the SEELS parent interview/survey sample.

Details of the LEA and student samples are provided below.

The SEELS LEA Sample

Defining the Universe of LEAs

The SEELS 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, such as correctional facilities;

[1] The 1999 Quality Education Data, Inc. (QED) database was used to construct the sampling frame.

[2] 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.

LEAs from U.S. territories; and LEAs with 10 or fewer students in the SEELS age range, which would be unlikely to have students with disabilities.

The public school universe data file maintained by Quality Education Data (QED, 1998) 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 (1997). Correcting for errors and duplications resulted in a master list of 13,426 LEAs that were expected to have at least one student receiving special education in the appropriate age range. These comprised the SEELS LEA sampling frame.

Stratification

The SEELS LEA sample was stratified to increase the precision of estimates by eliminating between-strata variance, 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 SEELS 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 include Northeast, Southeast, Midwest, and West).

LEA size (student enrollment). LEAs vary considerably by size, the most useful available measure of which is pupil 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 enrollment greater than 17,411 in grades 1 through 7)
- **Large** (estimated enrollment from 4,707 to 17,411 in grades 1 through 7)
- **Medium** (estimated enrollment from 1,548 to 4,706 in grades 1 through 7)
- **Small** (estimated enrollment between 10 and 1,547 in grades 1 through 7).

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) 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 2 through 7:

- High (0% to 12% Orshansky)
- Medium (13% to 34% Orshansky)

- Low (35% to 45% Orshansky)
- Very low (over 45% 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, 297 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 1,124 LEAs was invited to participate, from which 297 participating LEAs might be recruited. A total of 245 LEAs actually provided students for the sample. Although the sample of LEAs was somewhat smaller than anticipated, analyses of the characteristics of the LEA sample, in weighted and unweighted form, on the sampling variables of region, LEA size, and LEA wealth confirmed that that the weighted LEA sample closely resembled the LEA universe with respect to those variables, thus yielding an initial sample of LEAs that was representative of the nation.

In addition to ensuring that the LEA sample matched the universe of LEAs on variables used in the sampling, it was important to ascertain whether this stratified random sampling approach resulted in skewed distributions on relevant variables not included in the stratification scheme. Two variables from the QED database were chosen to compare the "fit" between the first-stage sample and the population: the LEA's metropolitan status and its proportion of minority students. Analyses revealed that the fit between the weighted LEA sample and the LEA universe was quite good.

The SEELS Student Sample

Determining the size of the SEELS student sample took into account the duration of the study, desired levels of precision, and assumptions regarding attrition and response rates. We calculated that approximately three students would need to be sampled for each one student who would have both a parent/guardian interview and a direct assessment in Wave 3 of SEELS data collection.

The SEELS sample design emphasizes the need to generate fairly precise estimates of proportions and ratios for students receiving special education as a whole and for each of the 12 special education disability categories. A level of precision for standard errors of 3.6% was considered sufficient for study purposes. Thus, by sampling 1,150 students per disability category (except for TBI and deaf-blind) in year 1, we estimated there would be 388 students per category with both a parent interview and a direct assessment in year 5. Assuming a 50% sampling efficiency (which will tend to be exceeded for almost all disability categories), the 388 students would achieve a standard error of estimate of 3.6%. In addition, all students with traumatic brain injury or with deaf-blindness in participating LEAs and special schools were selected

SRI contacted LEAs and special schools to obtain their agreement to participate in the study and request rosters of students receiving special education who were between the ages of 6 and

12 on September 1, 1999 and in at least first grade.[3] 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 to SRI).

After estimating the number of students receiving special education in the SEELS age range, the appropriate fraction of students in each category was selected randomly from each LEA. In addition, from the state-supported special schools, 100% of students with deaf-blindness, 50% of students with visual impairments, and 15% of those with hearing impairments were sampled. In cases in which more than one child in a family was included on a roster, only one child was eligible to be selected. LEAs and special schools were notified of the students selected and contact information for their parents/guardians was requested.

Parent Interview/Questionnaire

The data source for the findings reported here was parents/guardians of SEELS sample members, who were interviewed by telephone or through a questionnaire sent through the mail. The SEELS conceptual framework holds that a child'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.

Matches of names, addresses, and telephone numbers of SEELS parents with existing national locator databases were conducted to maximize the completeness and accuracy of contact information and subsequent response rates. Letters were sent to parents to notify them that their child had been selected for SEELS and that we would be attempting to contact them by telephone. A toll-free telephone number was included in the letter for parents to call in to be interviewed if they could not be reached by telephone or to make an appointment for the interview at a convenient time. If the computer match of contact information, letters mailed to parents, and attempted telephone interviews revealed that neither a working telephone number or accurate address was available for a student, that student was considered ineligible for the study and removed from the sample. Students who had no adult in the household who spoke either English or Spanish were ineligible for the study.

Computer-assisted telephone interviewing (CATI) was used for parent interviews, which were conducted between from mid-July through early December 2000. Interviews were conducted in both English and Spanish.

All parents with an accurate address who could not be reached by telephone were mailed a self-administered questionnaire in a period that extended from December 2000 through March 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.

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

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

	Number	Percentage
Total eligible sample	11,512	100.00
Respondents		
Completed telephone interview	8,624	74.9
Partial telephone interview completed	132	1.2
Complete mail questionnaire	1,068	9.3
Total respondents	9,824	85.3
Nonrespondents		
Refused	455	4.0
Language barrier	156	1.4
No response	1,077	9.4

Overall, 93% of respondents reported that they were parents of sample members (biological, adoptive, or step), and almost 1% were foster parents. Four percent were relatives other than parents, 1% were nonrelative legal guardians, and fewer than 1% reported other relationships to sample members.

Direct Assessment

Several of the dependent variables that are the subject of this report come from the SEELS direct assessment. Study designers felt that for students at this age level, some outcomes could only be assessed through a face to face assessment. The assessment was designed to measure a range of topics from academics to self concept and provide a mechanism to include the student "voice" in study data. The resulting standard assessment battery draws on the following published instruments to achieve these goals:

- Rapid letter naming and segmenting from the Comprehensive Test of Phonological Processing (CTOPP; Wagner, Torgeson, & Rashotte, 1999).
- Oral reading fluency from the Standard Reading Passages (Marston & Deno, 1986).
- Letter word identification (research edition) from the Woodcock Johnson III (Woodcock, McGrew, & Mather, 2001).
- Passage comprehension (research edition) from the Woodcock Johnson III (Woodcock, McGrew, & Mather, 2001).
- Mathematics calculation (research edition) from the Woodcock Johnson III (Woodcock, McGrew, & Mather, 2001).
- Math problem solving (research edition) from the Woodcock Johnson III (Woodcock, McGrew, & Mather, 2001).
- Student self concept scale (Gresham & Elliott, 1991).
- Student attitude measure (Wick, 1991).
- Loneliness scale (Asher, 1986).

Students whose educational programs depart from that of the general population and who are judged by their teachers to be ineligible for the standard assessment were eligible for a teacher

completed alternate assessment that draws on the following published instruments to achieve these goals:

- Scale of independent behavior-revised (SIBR; Bruininks, Woodcock, Weatherman & Hill, 1996).
- AAMR Adaptive Behavior Scales-School (ABS-S:2) (Lambert, Nihira & Leland, 1990).

The assessment data presented in this report come from the standard assessment. Eligibility for the assessment process included a complete parent interview or family questionnaire, parental consent, and availability of assessors in the area. Local assessors were hired by the study to conduct assessments. These assessors were predominantly school psychologists with backgrounds in assessment as well as some special education teachers. Assessors were responsible for completing between 9 and 30 assessments each. These assessments were conducted from March 2001 through August 2001.

Several steps were followed in order to complete assessments. (1) A screening questionnaire was conducted with teachers knowledgeable about student abilities to determine eligibility for standard vs. alternate assessment, specific subtests, and necessary accommodations. Students received the standard assessment as long as they were able to complete the 1st item on WJ3 letter word identification test. Accommodations during the assessment were intended to reflect the same ones used during instruction. (2) Arrange a suitable time and place to conduct the assessment. Most SEELS assessments were conducted in students' school sites, but some were conducted in family homes. (3) Assessments were conducted as arranged and data were sent to SRI. 4,912 completed standard or alternate assessments were returned for 7,806 eligible sample members (63% response).

School Data Collection

Additional data sources for the analyses reported here were primary language arts teachers of SEELS sample members and teachers most knowledgeable of students' overall programs, who were surveyed by mail. The SEELS conceptual framework holds that language arts instruction is central to the educational experiences of students with disabilities and that classroom context, curriculum, instruction, accommodations, and assessment are crucial to student outcomes and are most amenable to intervention. Language arts teachers are the most knowledgeable about these aspects of students' language arts programs. Further, student experiences span the school day and that content classes, related services, IEP goals, participation in district/state assessments all describe student experiences and relate to student progress. These data are best provided by teachers who are most knowledgeable about the student's program.

The first step in the school data collection process was to identify the current school attended by the sampled students during the 2000-2001 school year. School attendance data had been collected during the parent interview during the summer and fall of 2000. 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 or for students for whom there was no complete parent interview, school district records collected for sampling were used. School attendance data was sent to schools for verification using the School Enrollment Form (SER). In addition to

verification of attendance, the SER form requested that schools provide the name of the teacher who provided primary language arts instruction for the sampled student (for the teacher survey), as well as the name of the teacher who was most knowledgeable about the student's overall school program (for the school program survey).

In March 2001, packets were sent to each school (n=3,827), which included a teacher survey for each sample member, a school program survey for each sample member, and a single school characteristics survey for the school. A second packet was sent in April 2001. Additional mailings were conducted to individual teachers in May 2001 and September 2001. By December 2001, completed teacher surveys were returned for 6,250 out of 10,410 eligible sample members (60% response), and completed school program surveys were returned for 6,213 out of 10,410 eligible sample members (59% response).

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 students 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. SEELS approaches to these two issues are described in this section.

Maintaining the Analytic Sample Size

Two approaches are used in SEELS 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 SEELS 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 and special education language arts 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. Thus, the grades variable includes students who have either a parent interview, a teacher survey, which results in a much larger number of students 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. Measures involving receipt of particular interventions or

services (i.e., tutoring and modifications or accommodations to instruction or testing, presentation or communication, or those related to social adjustment) gave preference to data provided about such programs or services that were indicated on students' Individualized Education Plans (IEPs). If the school program survey was missing for a given student, but he or she had a 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 that were mentioned previous.

Thus, it can be beneficial to impute values on key variables for students who otherwise would be excluded from analyses because of missing data. Imputation procedures involve assigning a value for a student with missing data that is the best prediction for that student given what else is known about him or her. Although there are a variety of procedures for imputation, SEELS has employed a straightforward assignment of mean values that are calculated for a subset of students who resemble the students 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 students who share his or her disability category and whose head of household has the same level of education. These criteria for subsetting students for purposes of imputation were selected because they relate 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 students with same disability category and number of domains with functional limitation	97 to 225 (6.1% to 7.7%)
Functional cognitive skills scale	Mean value of students with same disability category and number of domains with functional limitation	1 to 19 (.1% to .5%)
Household income	Mean value of students with same disability category, head of household education, and race/ethnicity	83 to 241 (6.5% to 7.0%)
Family involvement at home	Mean value of students with same disability category and head of household education	0 to 5 (<.1%)
Family involvement at school	Mean value of students with same disability category and head of household education	30 to 122 (.8% to 4.1%)
School mobility—number of school changes other than grade-level progression	Mean value of students with same disability category, student age, and household income	3 to 7 (.1% to .4%)
Absences excluding suspensions and expulsions (used as an independent variable only)	Mean value of students with same disability category	288 to 809 (20.2 to 28.0%)
Percent of classes in general education	Mean value of students with same disability category	8 to 139 (.4% to 8.8%)
Number of minutes per week in language arts instruction	Mean value of students with the same disability category	20 to 376 (1.1% to 10.4%)

Understanding the characteristics of students included in analyses. As mentioned above, combining data from multiple sources in a given analysis necessarily limits the students included in it to those who have both data sources. It is important to understand the extent to which the included subset of students is similar to or differs from the full sample in order to know whether the results of the analysis generalize to all students or only to those represented in the subset. To address this question, SEELS compared means for all dependent and independent variables used in each multivariate model reported in this document with those of the full sample of students for whom there are data. The number of cases included in each model and the results of the analyses of means and standard errors are reported in Exhibit A-3. There are a number differences in the subsamples of data used for various models from their means for the entire sample. However, for the most part, these differences are small and, thus, unlikely to affect the results of the multivariate analyses. Below we describe these differences for dependent as well as independent variables.

Dependent Variables

The means values of the dependent variables in the subsamples used in most of the models do not differ from the means for the entire sample. Exceptions are that the percentage of students who belong to groups differs from the entire sample by 1 percentage point, mean grades differ by .1 point on a 9-point scale, and the gap between mathematics standardized tests and grade level differs by .12 of a grade level. In addition, the mean scores on the classroom behavior scores in general and special education differ by .2 points and .35 points, respectively, on a 5-point scale.

Independent Variables

The means of the following independent variables differ in the subsamples for one or more of the models from the entire sample.

Disability Characteristics

- The percentage of students with most disabilities in the subsamples used for the models does not differ from the total sample by more than 8 percentage points.

- The subsamples used for the models include from 6 to 13 percentage points more students with ADD/ADHD than the entire sample.

- Students included in the models of absenteeism, disciplinary action, belonging to groups, and classroom behavior in general education classes were an average of 1 to 4 months younger than students entire sample when their disability was discovered than students in the entire sample. Students included the models of motivation, passage comprehension, calculation, grades, retention in grade, locus of control, and classroom behavior in general education classes were an average of 1.8 to 5.0 months older when their disability was discovered than students entire sample.

- The mean number of domains in which students have problems differs in the subsamples for some of the models from the entire sample, but never by more than .1 problems, except for the model of classroom behavior in special education classes. In that subsample, the mean number of health problems exceeds that of the entire sample by .3 problems.

- The mean general health score of students in the subsample for the model of behavior in general education classes is .2 points higher than that of the entire sample on a 5-point scale. In contrast, the mean general health score of students in the subsample for the model of behavior in special education classes is .08 points lower than that of the entire sample.

Functioning

- Compared to the entire sample, students included in the analyses of motivation, passage comprehension, calculation, grades, retention, reading discrepancy,

mathematics discrepancy, and behavior in general education classrooms have higher average self-care skill scale scores functional mental skills scale scores, and social skills scale scores than the entire sample. Students included in the model of locus of control also have higher average functional mental skills than the entire sample. In contrast, students included in the models of days absent, disciplinary action, belonging to groups, and behavior in special education classrooms have lower average functional cognitive scale scores than the entire sample. Except for the models of classroom behavior, mean scores on the self-care skills scale do not differ from the entire sample by more than .2 on a 7-point scale, mean scores on the functional cognitive skills scale do not differ by more than .3 on a 13-point scale, and mean scores on the social skills scale do not differ by more than .3 on a 19-point scale. Compared with the entire sample of students, the mean scores on the self care ability scale, functional cognitive scale, and social skills scale for the subsample for the model of behavior in general education classes is are .1 points higher, 1.2 points higher, and .6 points higher, respectively, and the mean scores for the subample for the model of behavior in special education classes are .3, 1.1, and .3 points lower.

- Students' mean value on the persistence scale in the subsets for the models does not differ from the entire sample by more than .04 of a point on a 13-point scale.

Demographics

- Students included in the models of grades, retention in grade, locus of control, and behavior in special education classrooms were an average of approximately 3.1 months, 1.6 months, 1.7 months, and 1.6 months older, respectively, than the entire sample of students.. Students included in the model of classroom behavior in general education classrooms were an average of 3.7 months younger than the entire sample of students.

- In most of the models, the subsamples included a smaller proportion of minority students than the total sample; however, the greatest differences between the total sample and a subsample for any model were 6 percentage points for African American students, except for the model of behavior in general education classrooms, and 4 percentage points for Hispanic students. The subsample for the model of behavior in general education classrooms included .12 percentage points fewer African American students than the entire sample. Differences between the percentage of students who spoke a language other than English in the home in the samples for the models and the entire sample did not exceed 6 percentage points.

Household Characteristics

- The mean family income of students in subsamples for the models is higher than the mean for students in the entire sample, but never by more than .7 on 16-point scale, except for subsample for the model of behavior in general education classrooms, in which case it is 1.8 points higher than for the entire sample.

- The level of involvement of student's families at home is higher in subsamples for all models except absenteeism and behavior in special education classrooms than in the entire sample, but not by more than .4 on a 8-point scale. The mean level of involvement for the subsample for behavior in special education classrooms is 1 point lower than for the entire sample.

- The level of involvement of student's families in their schools is higher in all models except retention in grades and behavior in special education classrooms than in the entire sample, but never by more than .5 on a 13-point scale, except for behavior in general education classrooms. For that subsample, the difference is 1.0 points higher than for the entire sample. The mean for the subsample for the model of retention in grade does not differ from the mean for the entire sample, and the mean for the subsample for the model of behavior in special education classrooms is .2 points lower than for the entire sample.

- Expectations for postsecondary achievement in the subsets for the models do not differ from the entire sample by more than .1 point on a 4 scale, except for the models of classroom behavior. Compared with the mean for the entire sample, the mean for the subsample for the model of behavior in general education classrooms is higher by .3 points, and the mean for the subsample for the model of behavior in special education classrooms is lower by .2 points.

School Programs and Experiences

Maximum differences between the subsamples for the models, except models of classroom behavior, and the entire sample are as follows:

- Mean percentage of classes in general education: 5 percentage points.

- Mean class size: .6 of a student.

- Mean degree of modifications to the language arts curriculum: .4 on a 6-point scale.

- Mean number of modifications to tests: .3 modifications.

- Mean number of communication aides: .2 communication aides.

- Mean number of days absent: .2.

- Mean frequency with which students receive which whole-class instruction, small group instruction, and individual instruction from teachers: .2, .1, and .1, respectively on a 4-point scale.

- Mean level of participation in general instructional activities, literature reading activities, and skill building reading activities: 1.3 on a 29-point scale, .7 points on a 13-point scale, and .4 points on a 12-point scale, respectively.

- Mean grades: .06 on a 9-point scale.

- Mean number of times a students changed schools: .1 school changes.

- Percentage of students retained in grade: 2 percentage points.

- Percentage of students who receive tutoring from an adult: <.1 percentage point.

Compared with the means for the entire sample, differences between the subsamples for the models of classroom behavior and the entire sample are as follows:

- The mean percentage of classes in general education is 26.5 percentage points higher for the subsample for the model of behavior in general education classrooms and 23.6 percentage points lower for the subsample for the model of behavior in special education classes. Such differences are expected, given that one subsample purposely includes only students in general education classes and the other purposely includes only students in special education classes.

- The mean size of the student's language arts class is smaller by 7.5 for the subsample for the model of behavior in general education classrooms and smaller by 6.3 students for the model of behavior in special education classrooms.

- The mean number of modifications to tests is .73 smaller for the subsample for the model of behavior in general education and .73 larger for the subsample for the model of behavior in special education.

- The mean number days absent is .23 smaller for the subsample for the model of behavior in general education and .08 larger for the subsample for the model of behavior in special education.

- On a 4-point scale, the mean frequencies with which students receive which whole-class instruction, small group instruction, individual instruction from a teacher, and individual instruction from another adult are .4, .1, .1, and .1 points higher, respectively, for the subsample for the model of behavior in general education and .2, .2, .1, and .1 points lower, respectively, for the subsample for the model of behavior in special education.

- The mean levels of participation in literature reading activities and skill building reading activities are 1.1 points higher and .22 points higher, respectively, for the subsamples for the model of behavior in general education classrooms. The mean levels of participation in general instructional activities and literature reading activities are 20.2 points lower and .6 points lower, respectively, lower for the subsample for behavior in special education classrooms. The mean level of participation in skill building activities does not differ for the subsample for behavior in special education classrooms.

- Mean grades are .1 higher for the subsample for the model of behavior in general education classrooms and .1 lower for the model of behavior in special education classrooms.

- The mean number of times a student changed schools is .2 changes lower for the subsample for the model of behavior in general education classrooms and .1 changes higher or the model of behavior in special education classrooms.

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

		Multivariate Analysis of:													
	Entire Sample	Days Absent	Motivation for Schooling	Passage Comprehension	Calculation	Grades	Retained in Grade	Disciplinary Action	Belongs to Group	Sees Friends	Locus of Control	Reading Discrepancy	Mathematics Discrepancy	Classroom Behavior Scale (General Education)	Classroom Behavior Scale (Special Education)
Sample Size	**10,739**	**2,190**	**1,303**	**1,554**	**1,466**	**2,038**	**1,587**	**3,662**	**3,662**	**3,566**	**1,664**	**2,228**	**2,211**	**1,109**	**1,553**
DEPENDENT VARIABLES															
Average:															
Days absent per month	1.320	1.265	-	-	-	-	-	-	-	-	-	-	-	-	-
	(0.037)	(0.053)	-	-	-	-	-	-	-	-	-	-	-	-	-
Motivation for schooling	9.997	-	10.003	-	-	-	-	-	-	-	-	-	-	-	-
	(0.011)	-	(0.017)	-	-	-	-	-	-	-	-	-	-	-	-
Standard score on passage comprehension	80.117	-	-	79.331	-	-	-	-	-	-	-	-	-	-	-
	(0.367)	-	-	(0.571)	-	-	-	-	-	-	-	-	-	-	-
Standard score on calculation	89.079	-	-	-	88.401	-	-	-	-	-	-	-	-	-	-
	(0.335)	-	-	-	(0.514)	-	-	-	-	-	-	-	-	-	-
Overall grades across all subjects (9-point scale)	6.429	-	-	-	-	6.525	-	-	-	-	-	-	-	-	-
	(0.020)	-	-	-	-	(0.037)	-	-	-	-	-	-	-	-	-

Exhibit A-3
UNWEIGHTED SAMPLE SIZES OF FULL SAMPLE AND EACH MULTIVARIATE ANALYSIS AND MEANS AND STANDARD ERRORS OF VARIABLES INCLUDED IN THE FULL SAMPLE AND IN EACH MULTIVARIATE ANALYSIS (CONTINUED)

		Multivariate Model:													
	Entire Sample	Days Absent	Motivation for Schooling	Passage Comprehension	Calculation	Grades	Retained in Grade	Disciplinary Action	Belongs to Group	Sees Friends	Locus of Control	Reading Discrepancy	Mathematics Discrepancy	Classroom Behavior Scale (General Education)	Classroom Behavior Scale (Special Education)
Locus of control	10.005	-	-	-	-	-	-	-	-	-	10.044	-	-	-	-
	(0.012)	-	-	-	-	-	-	-	-	-	(0.017)	-	-	-	-
Discrepancy between grade level and reading level on standardized tests (in years)	-1.483	-	-	-	-	-	-	-	-	-	-	-1.569	-	-	-
	(0.026)	-	-	-	-	-	-	-	-	-	-	(0.041)	-	-	-
Classroom behavior scale score in general education classrooms (scale: 2 to 6)	12.446	-	-	-	-	-	-	-	-	-	-	-	-	12.251	-
	(0.047)	-	-	-	-	-	-	-	-	-	-	-	-	(0.072)	-
Classroom behavior scale score in special education classrooms (scale: 2 to 6)	11.550	-	-	-	-	-	-	-	-	-	-	-	-	-	11.904
	(0.045)	-	-	-	-	-	-	-	-	-	-	-	-	-	(0.063)
Discrepancy between grade level and mathematics level on standardized tests (in years)	-1.359	-	-	-	-	-	-	-	-	-	-	-	-1.476	-	-
	(0.024)	-	-	-	-	-	-	-	-	-	-	-	(0.037)	-	-
Percentage:														-	-
With disciplinary actions in the past year	0.153	-	-	-	-	-	-	0.112	-	-	-	-	-	-	-
	(0.003)	-	-	-	-	-	-	(0.005)	-	-	-	-	-	-	-
Retained at grade level in the past 3 years	0.118	-	-	-	-	-	0.137	-	-	-	-	-	-	-	-
	(0.005)	-	-	-	-	-	(0.009)	-	-	-	-	-	-	-	-
Belong to a group	0.606	-	-	-	-	-	-	-	0.633	-	-	-	-	-	-
	(0.005)	-	-	-	-	-	-	-	(0.008)	-	-	-	-	-	-

Exhibit A-3
UNWEIGHTED SAMPLE SIZES OF FULL SAMPLE AND EACH MULTIVARIATE ANALYSIS AND MEANS AND STANDARD ERRORS OF VARIABLES INCLUDED IN THE FULL SAMPLE AND IN EACH MULTIVARIATE ANALYSIS (CONTINUED)

		Multivariate Model:													
	Entire Sample	Days Absent	Motivation for Schooling	Passage Comprehension	Calculation	Grades	Retained in Grade	Disciplinary Action	Belongs to Group	Sees Friends	Locus of Control	Reading Discrepancy	Mathematics Discrepancy	Classroom Behavior Scale (General Education)	Classroom Behavior Scale (Special Education)
See friends at least weekly	0.551	-	-	-	-	-	-	-	-	0.556	-	-	-	-	-
	(0.005)	-	-	-	-	-	-	-	-	(0.008)	-	-	-	-	-
EXPLANATORY VARIABLES															
Individual Characteristics															
Percentage with:															
Speech impairment	0.094	0.036	0.044	0.041	0.042	0.043	0.037	0.039	0.039	0.040	0.041	0.043	0.043	0.068	0.018
	(0.003)	(0.004)	(0.006)	(0.005)	(0.005)	(0.004)	(0.005)	(0.003)	(0.003)	(0.003)	(0.005)	(0.004)	(0.004)	(0.008)	(0.003)
Mental retardation	0.097	0.100	0.091	0.093	0.087	0.087	0.093	0.093	0.093	0.095	0.090	0.091	0.090	0.039	0.134
	(0.003)	(0.006)	(0.008)	(0.007)	(0.007)	(0.006)	(0.007)	(0.005)	(0.005)	(0.005)	(0.007)	(0.006)	(0.006)	(0.006)	(0.009)
Emotional disturbance	0.099	0.076	0.087	0.083	0.086	0.091	0.085	0.078	0.078	0.079	0.091	0.084	0.085	0.071	0.084
	(0.003)	(0.006)	(0.008)	(0.007)	(0.007)	(0.006)	(0.007)	(0.004)	(0.004)	(0.005)	(0.007)	(0.006)	(0.006)	(0.008)	(0.007)
Hearing impairment	0.109	0.120	0.143	0.147	0.148	0.138	0.131	0.121	0.121	0.107	0.140	0.133	0.134	0.115	0.135
	(0.003)	(0.007)	(0.010)	(0.009)	(0.009)	(0.008)	(0.008)	(0.005)	(0.005)	(0.005)	(0.009)	(0.007)	(0.007)	(0.010)	(0.009)
Visual impairment	0.085	0.079	0.060	0.064	0.065	0.079	0.069	0.082	0.082	0.079	0.061	0.079	0.077	0.119	0.045
	(0.003)	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.010)	(0.005)

Exhibit A-3
UNWEIGHTED SAMPLE SIZES OF FULL SAMPLE AND EACH MULTIVARIATE ANALYSIS AND MEANS AND STANDARD ERRORS OF VARIABLES INCLUDED IN THE FULL SAMPLE AND IN EACH MULTIVARIATE ANALYSIS (CONTINUED)

	Multivariate Model:														
	Entire Sample	Days Absent	Motivation for Schooling	Passage Comprehension	Calculation	Grades	Retained in Grade	Disciplinary Action	Belongs to Group	Sees Friends	Locus of Control	Reading Discrepancy	Mathematics Discrepancy	Classroom Behavior Scale (General Education)	Classroom Behavior Scale (Special Education)
Orthopedic impairment	0.103	0.093	0.102	0.099	0.100	0.100	0.084	0.100	0.100	0.103	0.109	0.101	0.099	0.128	0.073
	(0.003)	(0.006)	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)	(0.008)	(0.006)	(0.006)	(0.010)	(0.007)
Other health impairment	0.082	0.109	0.141	0.133	0.136	0.128	0.141	0.116	0.116	0.119	0.149	0.124	0.122	0.145	0.091
	(0.003)	(0.007)	(0.010)	(0.009)	(0.009)	(0.007)	(0.009)	(0.005)	(0.005)	(0.005)	(0.009)	(0.007)	(0.007)	(0.011)	(0.007)
Autism	0.098	0.160	0.114	0.131	0.126	0.119	0.115	0.149	0.149	0.152	0.110	0.138	0.137	0.131	0.162
	(0.003)	(0.008)	(0.009)	(0.009)	(0.009)	(0.007)	(0.008)	(0.006)	(0.006)	(0.006)	(0.008)	(0.007)	(0.007)	(0.010)	(0.009)
Traumatic brain injury	0.038	0.037	0.033	0.035	0.035	0.037	0.033	0.035	0.035	0.036	0.034	0.038	0.037	0.032	0.039
	(0.002)	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)
Multiple disabilities or Deaf/blindness	0.079	0.084	0.052	0.052	0.048	0.053	0.068	0.083	0.083	0.084	0.052	0.055	0.057	0.034	0.118
	(0.003)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.008)
ADHD/HD	0.323	0.384	0.450	0.439	0.449	0.418	0.407	0.392	0.392	0.393	0.448	0.409	0.411	0.379	0.402
	(0.005)	(0.010)	(0.014)	(0.013)	(0.013)	(0.011)	(0.012)	(0.008)	(0.008)	(0.008)	(0.012)	(0.010)	(0.010)	(0.015)	(0.012)

Exhibit A-3
UNWEIGHTED SAMPLE SIZES OF FULL SAMPLE AND EACH MULTIVARIATE ANALYSIS AND MEANS AND STANDARD ERRORS OF VARIABLES INCLUDED IN THE FULL SAMPLE AND IN EACH MULTIVARIATE ANALYSIS (CONTINUED)

	Multivariate Model:														
	Entire Sample	Days Absent	Motivation for Schooling	Passage Comprehension	Calculation	Grades	Retained in Grade	Disciplinary Action	Belongs to Group	Sees Friends	Locus of Control	Reading Discrepancy	Mathematics Discrepancy	Classroom Behavior Scale (General Education)	Classroom Behavior Scale (Special Education)
Average:															
Age when child started having this difficulty/condition	2.886	2.715	3.134	3.035	3.100	3.089	3.298	2.753	2.753	2.802	3.081	2.911	2.930	3.057	2.578
	(0.030)	(0.057)	(0.076)	(0.069)	(0.071)	(0.061)	(0.073)	(0.044)	(0.044)	(0.045)	(0.067)	(0.057)	(0.057)	(0.082)	(0.067)
Number of problems reported for seeing, speaking, conversing, communicating, appendage use, and/or health	1.770	1.860	1.729	1.768	1.723	1.704	1.689	1.858	1.858	1.852	1.730	1.747	1.743	1.536	2.085
	(0.011)	(0.027)	(0.034)	(0.031)	(0.032)	(0.027)	(0.032)	(0.021)	(0.021)	(0.021)	(0.030)	(0.026)	(0.026)	(0.034)	(0.033)
General health score (scale: 1 to 5)	3.962	3.997	-	-	-	-	-	-	-	-	-	-	-	4.167	3.880
	(0.012)	(0.023)	-	-	-	-	-	-	-	-	-	-	-	(0.030)	(0.028)
Self care ability scale score (scale: 2 to 8)	7.043	7.006	7.266	7.228	7.269	7.239	7.243	7.039	7.039	7.031	7.259	7.207	7.214	7.185	6.789
	(0.013)	(0.030)	(0.030)	(0.029)	(0.029)	(0.025)	(0.030)	(0.023)	(0.023)	(0.023)	(0.027)	(0.025)	(0.025)	(0.034)	(0.037)
Functional cognitive skills scale score (scale: 4 to 16)	11.165	10.946	11.724	11.553	11.731	11.816	12.058	11.032	11.032	11.037	11.797	11.486	11.490	12.333	10.081
	(0.031)	(0.075)	(0.080)	(0.076)	(0.075)	(0.068)	(0.080)	(0.058)	(0.058)	(0.059)	(0.073)	(0.067)	(0.067)	(0.086)	(0.090)
Social skills scale score: 9 To 27)	19.732	19.860	19.998	19.930	19.987	20.052	20.011	19.809	19.809	19.802	-	20.036	20.048	20.344	19.429
	(0.036)	(0.071)	(0.089)	(0.082)	(0.084)	(0.070)	(0.080)	(0.055)	(0.055)	(0.055)	-	(0.068)	(0.068)	(0.096)	(0.084)

Exhibit A-3
UNWEIGHTED SAMPLE SIZES OF FULL SAMPLE AND EACH MULTIVARIATE ANALYSIS AND MEANS AND STANDARD ERRORS OF VARIABLES INCLUDED IN THE FULL SAMPLE AND IN EACH MULTIVARIATE ANALYSIS (CONTINUED)

	Multivariate Model:														
	Entire Sample	Days Absent	Motiva-tion for Schooling	Passage Comprehension	Calcu-lation	Grades	Retained in Grade	Disciplinary Action	Belongs to Group	Sees Friends	Locus of Control	Reading Discrepancy	Mathematics Discrepancy	Classroom Behavior Scale (General Education)	Classroom Behavior Scale (Special Education)
Persistence scale score (scale: 6 to 18)	2.131	2.161	2.160	2.156	2.164	2.174	2.162	2.137	2.137	2.132	2.162	2.170	2.170	2.170	2.119
	(0.007)	(0.015)	(0.019)	(0.017)	(0.018)	(0.015)	(0.017)	(0.011)	(0.011)	(0.012)	(0.017)	(0.014)	(0.015)	(0.020)	(0.018)
Age as of 12/01/2000	10.311	10.241	10.376	10.347	10.363	10.568	11.655	10.296	10.296	10.278	10.452	10.278	10.275	10.005	10.443
	(0.017)	(0.039)	(0.049)	(0.045)	(0.047)	(0.039)	(0.028)	(0.030)	(0.030)	(0.030)	(0.043)	(0.038)	(0.038)	(0.053)	(0.047)
Percentage															
Male	0.661	0.672	0.664	0.668	0.667	0.664	0.674	0.664	0.664	0.665	0.664	0.664	0.666	0.654	-
	(0.004)	(0.010)	(0.013)	(0.012)	(0.012)	(0.010)	(0.012)	(0.008)	(0.008)	(0.008)	(0.012)	(0.010)	(0.010)	(0.014)	-
African American	0.217	0.173	0.157	0.157	0.149	0.169	0.175	0.165	0.165	0.165	0.153	0.158	0.157	0.094	0.223
	(0.004)	(0.008)	(0.010)	(0.009)	(0.009)	(0.008)	(0.010)	(0.006)	(0.006)	(0.006)	(0.009)	(0.008)	(0.008)	(0.009)	(0.011)
Hispanic	0.129	0.126	0.092	0.095	0.098	0.128	0.123	0.122	0.122	0.121	0.088	0.126	0.127	0.097	0.149
	(0.003)	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)	(0.008)	(0.005)	(0.005)	(0.005)	(0.007)	(0.007)	(0.007)	(0.009)	(0.009)
Other race/ethnicity	0.035	0.025	0.024	0.024	0.025	0.021	0.025	0.025	0.025	0.024	0.024	0.026	0.025	0.031	0.020
	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.005)	(0.004)
Language other than English regularly spoken in home	0.179	0.174	0.142	0.149	0.149	0.176	0.169	0.169	0.169	0.161	0.138	0.173	0.174	0.115	0.219
	(0.004)	(0.008)	(0.010)	(0.009)	(0.009)	(0.008)	(0.009)	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)	(0.008)	(0.010)	(0.010)

Exhibit A-3
UNWEIGHTED SAMPLE SIZES OF FULL SAMPLE AND EACH MULTIVARIATE ANALYSIS AND MEANS AND STANDARD ERRORS OF VARIABLES INCLUDED IN THE FULL SAMPLE AND IN EACH MULTIVARIATE ANALYSIS (CONTINUED)

	Multivariate Model:														
	Entire Sample	Days Absent	Motivation for Schooling	Passage Comprehension	Calculation	Grades	Retained in Grade	Disciplinary Action	Belongs to Group	Sees Friends	Locus of Control	Reading Discrepancy	Mathematics Discrepancy	Classroom Behavior Scale (General Education)	Classroom Behavior Scale (Special Education)
Household characteristics															
Average:															
Family income (scale: 1 to 16)	7.809	8.380	8.429	8.446	8.517	8.281	8.467	8.505	8.505	8.561	8.541	8.413	8.438	9.565	7.504
	(0.042)	(0.102)	(0.130)	(0.120)	(0.124)	(0.105)	(0.120)	(0.079)	(0.079)	(0.080)	(0.115)	(0.101)	(0.101)	(0.142)	(0.118)
Family involvement at home (scale 1 to 8)	7.640	7.715	8.009	7.997	8.039	8.020	7.771	7.731	7.731	7.727	7.996	7.973	7.979	7.234	6.617
	(0.015)	(0.038)	(0.037)	(0.035)	(0.035)	(0.031)	(0.039)	(0.029)	(0.029)	(0.029)	(0.033)	(0.031)	(0.031)	(0.033)	(0.041)
Family involvement at school (scale: 0 to 12)	4.073	4.297	4.550	4.556	4.588	4.443	4.200	4.432	4.432	4.482	4.595	4.495	4.504	5.077	3.874
	(0.024)	(0.062)	(0.082)	(0.075)	(0.077)	(0.065)	(0.073)	(0.049)	(0.049)	(0.050)	(0.073)	(0.062)	(0.063)	(0.090)	(0.071)
Expectations for postsecondary education score (scale: 1 to 4)	2.905	2.903	3.005	2.981	3.000	3.002	2.901	2.907	2.907	2.908	3.006	2.995	2.996	3.196	2.701
	(0.009)	(0.018)	(0.021)	(0.020)	(0.020)	(0.017)	(0.021)	(0.014)	(0.014)	(0.014)	(0.019)	(0.017)	(0.017)	(0.021)	(0.022)
School program and experiences															
Average:															
Percentage of classes in general education	56.753	53.243	60.945	58.640	59.991	58.098	53.937	55.726	55.726	56.943	61.712	58.526	58.476	83.287	33.180
	(0.258)	(0.721)	(0.873)	(0.816)	(0.831)	(0.719)	(0.822)	(0.551)	(0.551)	(0.548)	(0.764)	(0.686)	(0.687)	(0.520)	(0.667)

Exhibit A-3
UNWEIGHTED SAMPLE SIZES OF FULL SAMPLE AND EACH MULTIVARIATE ANALYSIS AND MEANS AND STANDARD ERRORS OF VARIABLES INCLUDED IN THE FULL SAMPLE AND IN EACH MULTIVARIATE ANALYSIS (CONTINUED)

	Multivariate Model:														
	Entire Sample	Days Absent	Motiva-tion for Schooling	Passage Comprehension	Calcu-lation	Grades	Retained in Grade	Disciplinary Action	Belongs to Group	Sees Friends	Locus of Control	Reading Discrepancy	Mathematics Discrepancy	Classroom Behavior Scale (General Education)	Classroom Behavior Scale (Special Education)
Size of language arts class	15.661	15.016	16.045	15.557	15.801	15.875	15.661	-	-	-	-	-	-	23.154	9.350
	(0.113)	(0.176)	(0.228)	(0.207)	(0.214)	(0.189)	(0.222)	-	-	-	-	-	-	(0.167)	(0.110)
Number of social adjustment supports	0.441	0.443	0.437	0.442	0.443	0.427	-	0.432	0.432	0.421	0.429	0.435	0.439	0.344	0.502
	(0.010)	(0.016)	(0.021)	(0.019)	(0.020)	(0.017)	-	(0.012)	(0.012)	(0.012)	(0.019)	(0.016)	(0.016)	(0.021)	(0.020)
Scale of change in language arts curriculum (scale: 2-8)	4.219	4.199	3.816	3.897	3.852	3.890	4.064	-	-	-	-	3.929	3.928	3.087	4.972
	(0.023)	(0.036)	(0.039)	(0.037)	(0.038)	(0.033)	(0.040)	-	-	-	-	(0.032)	(0.033)	(0.036)	(0.039)
Number of modifications to tests, assignments, grades, etc	4.059	-	4.187	4.231	4.215	4.269	4.321	-	-	-	4.200	4.260	4.270	3.331	4.782
	(0.035)	-	(0.074)	(0.068)	(0.070)	(0.059)	(0.068)	-	-	-	(0.066)	(0.057)	(0.057)	(0.077)	(0.067)
Number of presentation/communication aides	0.793	-	0.622	0.650	0.625	0.670	0.727	-	-	-	0.651	0.691	0.688	-	-
	(0.015)	-	(0.030)	(0.028)	(0.028)	(0.024)	(0.027)	-	-	-	(0.027)	(0.023)	(0.023)	-	-
Days absent from class	1.329	-	1.213	1.174	1.175	1.224	1.326	1.295	1.295	1.303	1.218	1.250	1.249	1.097	1.412
	(0.016)	-	(0.058)	(0.050)	(0.051)	(0.046)	(0.054)	(0.037)	(0.037)	(0.037)	(0.049)	(0.047)	(0.047)	(0.051)	(0.064)
Highest level of teacher's education	2.288	-	2.308	2.311	2.319	2.264	2.294	-	-	-	-	2.297	2.297	-	-
	(0.012)	-	(0.026)	(0.024)	(0.025)	(0.021)	(0.023)	-	-	-	-	(0.020)	(0.020)	-	-

Exhibit A-3
UNWEIGHTED SAMPLE SIZES OF FULL SAMPLE AND EACH MULTIVARIATE ANALYSIS AND MEANS AND STANDARD ERRORS OF VARIABLES INCLUDED IN THE FULL SAMPLE AND IN EACH MULTIVARIATE ANALYSIS (CONTINUED)

	Multivariate Model:														
	Entire Sample	Days Absent	Motiva-tion for Schooling	Passage Comprehension	Calcu-lation	Grades	Retained in Grade	Disciplinary Action	Belongs to Group	Sees Friends	Locus of Control	Reading Discrepancy	Mathematics Discrepancy	Classroom Behavior Scale (General Education)	Classroom Behavior Scale (Special Education)
Frequency of whole-class instruction for student (scale: 1 to 4)	3.256	-	-	3.394	3.413	3.416	3.415	-	-	-	-	3.373	3.369	3.656	3.064
	(0.014)	-	-	(0.024)	(0.024)	(0.020)	(0.023)	-	-	-	-	(0.020)	(0.020)	(0.018)	(0.029)
Frequency of small group instruction for student (scale: 1 to 4)	3.355	-	-	3.450	3.447	3.419	3.358	-	-	-	-	3.451	3.451	3.249	3.560
	(0.011)	-	-	(0.018)	(0.019)	(0.016)	(0.019)	-	-	-	-	(0.015)	(0.015)	(0.021)	(0.019)
Frequency of individual instruction from teacher for student (scale: 1 to 4)	3.324	-	-	3.293	3.274	3.275	3.263	-	-	-	-	3.306	3.306	3.177	3.444
	(0.010)	-	-	(0.018)	(0.018)	(0.016)	(0.019)	-	-	-	-	(0.015)	(0.015)	(0.022)	(0.018)
Frequency of individual instruction from another for student (scale: 1 to 4)	3.324													2.726	2.722
	(0.010)													(0.032)	(0.031)
Participation in general instructional activities (scale 0-28)	20.858	21.126	22.113	21.858	22.000	22.047	21.638	-	-	-	-	21.860	21.873	-	0.674
	(0.062)	(0.096)	(0.088)	(0.086)	(0.086)	(0.079)	(0.104)	-	-	-	-	(0.075)	(0.075)	-	(0.012)
Participation in literature reading activities overall (scale 0-12)	8.776	-	9.492	9.334	9.448	9.410	9.188	-	-	-	-	9.331	9.342	9.851	8.185
	(0.037)	-	(0.055)	(0.054)	(0.052)	(0.048)	(0.062)	-	-	-	-	(0.047)	(0.047)	(0.055)	(0.075)

Exhibit A-3
UNWEIGHTED SAMPLE SIZES OF FULL SAMPLE AND EACH MULTIVARIATE ANALYSIS AND MEANS AND STANDARD ERRORS OF VARIABLES INCLUDED IN THE FULL SAMPLE AND IN EACH MULTIVARIATE ANALYSIS (CONCLUDED)

	Multivariate Model:														
	Entire Sample	Days Absent	Motivation for Schooling	Passage Comprehension	Calculation	Grades	Retained in Grade	Disciplinary Action	Belongs to Group	Sees Friends	Locus of Control	Reading Discrepancy	Mathematics Discrepancy	Classroom Behavior Scale (General Education)	Classroom Behavior Scale (Special Education)
Participation in skill building reading activities (scale 0-12)	9.384	-	9.779	9.725	9.766	9.739	9.284	-	-	-	-	9.775	9.787	9.606	9.352
	(0.031)	-	(0.049)	(0.046)	(0.047)	(0.041)	(0.052)	-	-	-	-	(0.039)	(0.039)	(0.055)	(0.064)
Typical grades received for coursework (scale: 1 to 9)	2.692	-	-	-	-	-	-	2.634	2.634	-	-	-	-	2.764	2.605
	(0.010)	-	-	-	-	-	-	(0.017)	(0.017)	-	-	-	-	(0.031)	(0.028)
Number of school changes	0.904	0.918	0.854	0.869	0.875	0.913	1.026	0.893	0.893	0.885	0.865	0.883	0.888	0.718	1.040
	(0.010)	(0.026)	(0.033)	(0.030)	(0.031)	(0.027)	(0.032)	(0.020)	(0.020)	(0.020)	(0.029)	(0.025)	(0.026)	(0.033)	(0.032)
Percentage:															
Ever retained in grade	0.238	0.243	0.262	0.267	0.268	0.260	-	0.248	0.248	0.246	0.255	0.263	0.261	0.241	0.258
	(0.004)	(0.009)	(0.012)	(0.011)	(0.012)	(0.010)	-	(0.007)	(0.007)	(0.007)	(0.011)	(0.009)	(0.009)	(0.013)	(0.011)
Who receive tutoring from an adult	0.568	-	0.523	0.542	0.533	0.551	0.551	-	-	-	-	0.560	0.560	-	-
	(0.006)	-	(0.014)	(0.013)	(0.013)	(0.011)	(0.012)	-	-	-	-	(0.011)	(0.011)	-	-

- =Variable not in model.

Weighting Wave 1 Data

The percentages and means reported in the data tables are estimates of the true values for the population of students with disabilities in the SEELS age range. The estimates are calculated from responses of parents of SEELS sample members. The response for each sample member is weighted to represent the number of students 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 SEELS 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 SEELS 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 Weight for Category	D Weighted Value for Category
Learning disability	1	1	4.3	4.3
Speech/language impairment	1	1	3.0	3.0
Mental retardation	1	1	1.0	1.0
Emotional disturbance	1	0	.8	0
Hearing impairment	1	1	.1	.1
Visual impairment	1	1	.1	.1
Orthopedic impairment	1	0	.1	0
Other health impairment	1	1	.4	.4
Autism	1	0	.1	0
Multiple disabilities	1	0	.1	0
TOTAL	10	6	10	8.9
	Unweighted sample percentage = 60% (Column B total divided by Column A total)		Weighted population estimate = 89% (Column D total divided by Column C total)	

The students in LEAs and state schools with parent interview/survey data were weighted to represent the universe of students in LEAs and state schools 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), then we would estimate there to be 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 5 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 1999-2000 school year (OSEP, 2001).

As mentioned earlier, the imposition of constraints on the adjusted weights increased sampling efficiency at the cost of introducing a small amount of bias. The largest increases in sampling efficiency and the largest biases occurred for the categories of autism and visual impairment; the smallest increase in efficiency and biases occurred for specific learning disabilities. The principal bias for autism was the reduction in the proportion of students from the Northeast (from 22% to 18%), from the West/Southwest (from 34% to 30%) and from small LEAs (from 16% to 13%). The principal bias for visual impairment is in small LEAs (from 12% to 4%), in very wealthy LEAs (from 20% to 17%). For the category of learning disability, all biases introduced by the imposition of constraints on the student weights are negligible. Considering the increase in sampling efficiency for autism (from 23% to 53%) and visual impairment (from 18% to 53%), we consider these biases to be 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, in small LEAs, there were only six students with visual impairments with data, requiring that they represent an estimated 1,771 students with visual impairments from small LEAs. The weighting program determined that the average weight required (i.e., 295) violated the constraints, and therefore reduced these weights to a more reasonable value (i.e., 84.4).

Estimating Standard Errors

The SEELS sample is both stratified and clustered, so that calculating standard errors by formula is not straightforward. Standard errors for means and proportions can also be 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, we developed a set of weights for each of 50 half-replicate subsamples. Each half-replicate involved randomly selecting half of the total set of LEAs that provided contact information and then weighting that half to represent the entire universe. Randomization was accomplished within each of the 64 sampling cells. 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 SEELS, and it is computationally expensive. In the past, we have found that 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

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

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*.

SEELS 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, we multiplied the initial estimate by a "safety factor" that assures that we will not underestimate the standard error of estimate.

To determine the adequacy of fit of the variance estimate based on the effective sample size and to estimate the required safety factor, we selected 24 questions with 95 categorical and 2 continuous responses. We calculated standard errors of estimates 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, we considered this to be an adequate margin of safety. All standard errors in Wave 1 are 3% or less, except for categories of deaf-blindness and traumatic brain injury, where sample sizes are very small.

Calculating Significance Levels

Readers may want to compare percentages or means for different subgroups to determine, for example, whether the difference in the percentage of students in poverty between students with learning disabilities and those with mental retardation is greater than would be expected to occur by chance. To calculate whether the difference between percentages is statistically significant with 95% confidence (often denoted as $p<.05$), 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 students, 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: $Y' = a + b_1X_1 + b_2X_2 + ... + b_nX_n$, where Y' is the predicted value of the dependent variable, a is the constant or Y intercept, bs are the partial regression coefficients, and X's are the values of the independent variables. When the dependent variables are dichotomous (i.e., whether student 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(probability of criminal justice system involvement/no involvement) $= a + b_1X_1 + b_2X_2 + ... + b_nX_n$]. 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.

SEELS 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 analyses of the relationships of individual social adjustment interventions or supports to related outcomes reported in Chapter 5, Exhibit 5-10 (i.e., receipt of mental health, social work, or behavior intervention services; participation in an anger management program; or having a behavior management plan) considered each of those interventions separately (along with all other individual, household, or school factors) because of higher intercorrelations among them. Coefficients for the individual, household, and other school factors in those analyses are those resulting from analyses that exclude the individual interventions.

In reporting the explained variation for multivariate analyses, an r^2 is used for a linear regression, which describes the percent of the variance in a continuous variable explained by the model. Although an r^2 can be calculated for dichotomous variables used in logistic regression, it

is much less useful than for continuous variables owing to the near constancy of variance over wide ranges of underlying probabilities of success. Many alternative pseudo-r^2 statistics have been proposed to measure "goodness of fit" of logistic regression models, but most of these are quite complex and difficult to interpret.

This report uses a statistic that we have called "predictive improvement". This statistic is scaled from 0 to 1, like r^2 is easier to interpret than pseudo-r^2 statistics, and heuristically represents the proportion of the maximum possible improvement in predictive ability associated with the explanatory (independent) variables in a logistic regression.[4] Referred to as "predictive improvement" (PI), the statistic is calculated in the following way:

$$PI = 1 - (e_0 + e_1)$$

Where

e_0 is the model's "rate of error" in predicting observations that actually have a value of 1 on the dependent variable This is obtained by taking the mean of the values predicted by the model for those observations.

and

e_1 is1 model's rate of error in predicting observations that actually have a value of 0 on the dependent variable. This is obtained by taking 1 minus the mean of the values predicted by the model for those observations.

This simple statistic represents the percentage of improvement in predictive power that a specific logistic model gives over a logistic model that includes only a constant term.[5] For a model that

[4] The PI statistic was developed by Harold Javitz.

[5] More specifically, consider an experiment in which two logistic models are used to predict the probability of a positive outcome. One of these models includes only a constant, and the other includes a variety of explanatory (independent) variables. After fitting the model, the data set is divided into two groups—individuals with a positive outcome and individuals with a negative outcome. A large number of individuals (say 1,000) are selected from the first group randomly and with replacement. The same number of individuals are selected from the second group randomly and with replacement. Using the logistic model that includes only a constant term, the experimenter estimates the probability of a positive outcome for each of these 2,000 selections. (When the model only includes a constant term, this probability will always equal the proportion of positive outcomes in the original dataset). Once this probability is estimated for an individual, the experimenter flips a coin with that same probability for heads. If the coin comes up heads and the individual actually had a positive outcome, or if the coin comes up tails and the individual actually had a negative outcome, then the experimenter scores a success; otherwise the experimenter scores a failure. Using the logistic model with only a constant term, the overall proportion of successes for these 2,000 randomly selected individuals will be approximately 50%. The experimenter now repeats this process using the logistic model with one or more explanatory variables. (In this case, the estimated probability of success will vary from person to person, and therefore the coin that the experimenter flips will have probability of a heads that also varies from person to person). The overall proportion of successes for the same 2,000 randomly selected individuals will typically be greater than 50% (depending on the extent to which the explanatory variables improve predictive accuracy). Suppose that the overall proportion of successes is 74%. Then the use of the explanatory variables has increased the proportion of correct guesses from 50% to 74%. This is an improvement of 24%. Since the maximum improvement is 50% (i.e., improving predictive accuracy from 50% to 100%), the percent

predicts no better than chance, PI has a value of 0. As a model's predictive power improves, the value of PI increases, so that if a model were able to predict every observation perfectly, PI would have a value of 1.

Measurement Issues

The chapters in this report include information on specific variables included in analyses. However, several general points about SEELS 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 SEELS age range receiving special education in the 1999-2000 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. Definitions of disability categories and criteria and methods for assigning students to them vary from state and to state and even between districts within states. Because we have relied on category assignments made by schools and districts, SEELS 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 disability by their school or district. Hence, descriptive data are nationally generalizable to students in the SEELS age range who were classified as having a particular disability in the 1999-2000 school year.

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 students 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.

Parents and teachers also were given an option of reporting qualitative indicators of student performance (e.g., excellent, good, fair, poor, or passing/not passing) if students do not receive traditional letter grades. 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.

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improvement is 24% x 2 = 48%. It can be shown mathematically that this is the same value as would be obtained by using the formula for PI given above.

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 motivation for schooling. This outcome is presented as a measure of engagement in Chapter 3. The student interview portion of the direct assessment includes a series of seven semantic differential items from the Motivation for Schooling subscale from the School Attitude Measure (Wick, 1991). The SAM includes different sets of items for students in the age groups 6 and 7 years, 8 and 9 years, 10 and 11 years, 12 and 13 years and 14 years or older. The response categories for the 6- and 7-year-old group were dichotomous, with 0=no and 1=yes. For the remaining age groups, the response categories were as follows: 1=never agree; 2=sometimes agree; 3=usually agree; and 4=always agree. To create a common motivation for schooling variable across the age groups, dichotomous responses for the 6- and 7-year-olds were recoded into the following categories so that 0 (no)=1 (never agree) and 1 (yes)=4 (always agree). The scale includes the following items common across age groups:

- I am happiest when I am at school
- School is the best place for me to learn
- Mondays are great because I get to come back to school
- School will help me have a better life
- Going to school is not boring for me
- I am excited about school and look forward to it
- I am looking forward to several more years of school

A scale was created by summing values on these items, which ranges from 7 (all responses "never agree") to 28 (all responses "always agree").

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 series of 10 items to be completed by respondents for all students 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 students 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").

Measuring locus of control. This outcome is also presented in Chapter 6. The student interview portion of the direct assessment included a series of four semantic differential items from the Locus of Control subscale from the School Attitude Measure (Wick, 1990). As noted regarding the measure of motivation for schooling, the SAM includes different sets of items for students in different age groups. The dichotomous response categories for the 6- and 7-year-olds were recoded so that 0 (no)=1 (never agree) and 1 (yes)=4 (always agree). The scale included the following items common across age groups:

- Most things I do at school turn out wrong
- A student like me will not get good grades
- I have no control over the grades I get
- I don't know how to do better in school

A scale was created by summing values on these items, which ranges from 4 (all responses "never agree") to 16 (all responses "always agree").

Comparisons with the general population of students. Many of the analyses reported here do not have precise statistical comparisons with the general population of students. Instead, we usually have drawn comparisons using published data. For many of these comparisons, differences in samples (e.g., ages of students) or measurement (e.g., question wording on surveys) reduce the direct comparability of SEELS 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. Comparisons using data from the National Household Education Survey (NHES) are more precise because an analysis file was created from the publicly available data to match the age of SEELS students.

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Appendix B
Standard Errors and Sample Sizes

Exhibit 3-1
(ATTITUDES TOWARD SCHOOL)

Have parents who agree that their child enjoys school	9,578
Strongly agree	(1.2)
Agree	(1.2)
Disagree/strongly disagree	(.8)
Motivation toward school	3,206
High (scores of 13 to 16) [b]	(3.9)
Moderate (scores of 8 to 12) [b]	(3.5)
Low (scores of 4 to 7) [b]	(3.4)

Standard errors are in parentheses.

Exhibit 3-2
(MOTIVATION FOR SCHOOLING)

	Never	Sometimes Agree	Usually Agree	Always Agree	Sample Size
I look forward to each new school year	(.2)	(.4)	(.3)	(.7)	
School will help me have a better life	(.2)	(.4)	(.3)	(.7)	
I don't like to stay home from school	(.2)	(.4)	(.3)	(.7)	
I look forward to more years of school	(.2)	(.4)	(.3)	(.7)	
I like Mondays because I come back to school	(.2)	(.4)	(.3)	(.7)	
School is the best place to learn	(.2)	(.4)	(.3)	(.7)	
I am happy at school	(.2)	(.4)	(.3)	(.7)	

Standard errors are in parentheses.

Exhibit 3-3
(ABSENTEEISM)

	Sample Size	Standard Error
Mean number of days absent in 1 month	4,618	.2
Percentage absent 6 or more days in 1 month	4,618	.7

Exhibit 3-4
(CLASSROOM ENGAGEMENT SCALE SCORES IN LANGUAGE ARTS, BY CLASS SETTING)

	General Education	Special Education
Percentage less engaged (scores of 5 to 7)	(1.0)	(1.3)
Percentage highly engaged (scores of 13 to 16)	(3.0)	(2.2)
Mean scores	(.2)	(.2)
Sample size	2,610	3,444

Standard errors are in parentheses.

Exhibit 3-5
(CLASSROOM ENGAGEMENT BEHAVIORS)

	Rarely	Some-times	Usually/ Very Often	Sample Size
Participates in group discussions				
General education	(.2)	(.4)	(.3)	2,640
Special education	(.1)	(.3)	(.2)	3,418
Complete homework on time				
General education	(.2)	(.4)	(.3)	2,608
Special education	(.1)	(.3)	(.2)	3,375
Follows directions				
General education	(.2)	(.4)	(.3)	2,610
Special education	(.1)	(.3)	(.2)	3,444
Keeps at task until finished, even if it takes a long time				
General education	(.2)	(.4)	(.3)	2,611
Special education	(.1)	(.3)	(.2)	3,434
Does things on own even if hard				
General education	(.2)	(.4)	(.3)	2,613
Special education	(.1)	(.3)	(.2)	3,433

Standard errors are in parentheses.

Exhibit 3-6
(STUDENTS' SCHOOL ENGAGEMENT, BY DISABILITY CATEGORY)

	LD[1]	SP	MR	SED	HI	VI	OI	OHI	AUT	TBI	MULT
Enjoyment of school											
Percentage whose parents agree that their child enjoys school [a]	1,036	826	858	857	1,018	803	964	914	1,090	348	828
Strongly agree	(2.0)	(2.3)	(2.3)	(2.0)	(2.5)	(3.0)	(2.5)	(2.4)	(2.4)	(4.5)	(2.7)
Disagree/strongly disagree	(1.4)	(1.3)	(1.3)	(1.9)	(1.3)	(1.4)	(1.1)	(1.7)	(1.4)	(3.4)	(1.2)
Motivation for schooling [b]	359	276	271	298	353	182	322	379	231	97	131
Percentage with low motivation scale scores (7 to 13)	(2.7)	(1.9)	(2.4)	(3.1)	(2.6)	(3.2)	(2.8)	(3.0)	(3.4)	(6.8)	(4.0)
Percentage with high motivation scale scores (21 to 28)	(3.8)	(4.2)	(4.3)	(4.1)	(4.)	(5.7)	(4.5)	(3.8)	(5.7))	(8.0)	(7.7)
Absenteeism [c]	508	442	468	381	524	392	451	370	547	167	330
Average days absent in 1 month	(.3)	(.2)	(.2)	(.4)	(.3)	(.3)	(.2)	(.2)	(.2)	(.5)	(.3)
Percentage absent 6 or more days in 1 month	(1.4)	(.9)	(1.7)	(1.8)	(1.4)	(2.0)	(1.7)	(1.9)	(1.5)	(3.4)	(2.4)
Classroom engagement behaviors [d]											
Percentage with high classroom engagement scale scores (15 or 16) in:											
General education class	338	487	96	206	270	304	322	270	197	77	52
	(5.7)	(4.3)	(8.0)	(6.1)	(5.8)	(6.6)	(6.4)	(5.3)	(6.4)	(12.4)	(14.8)
Special education class	354	86	521	306	436	200	275	220	467	147	375
	(5.6)	(11.3)	(4.1)	(5.6)	(6.3)	(8.4)	(6.8)	(5.7)	(3.8)	(10.0)	(5.8)
Percentage with low classroom engagement scale scores (4 to 8) in:											
General education class	338	487	96	206	270	304	322	270	197	77	52
	(2.0)	(1.4)	(4.6)	(3.3)	(.0)	(1.4)	(1.0)	(1.6)	(2.3)	(3.9)	(8.1)
Special education class	354	86	521	306	436	200	275	220	467	147	375
	(1.3)	(5.4)	(2.1)	(2.8)	(2.2)	(7.0)	(3.6)	(2.2)	(3.1)	(2.9)	(4.2)

Standard errors are in parentheses.

[1]Note: All tables that indicate disability categories refer to the following: LD=learning disability; SP=speech impairment; MR=mental retardation; SED=serious emotional disturbance; HI=hearing impairment; VI=visual impairment; OI=orthopedic impairment; OHI=other health impairment; Aut=autism; TBI=traumatic brain injury; MULT=multiple disabilities.

Exhibit 4-1
(STUDENTS' GRADES, BY DISABILITY CATEGORY)

	All	LD	SP	MR	SED	HI	VI	OI	OHI	AUT	TBI	MULT
Overall grades	860	611	539	697	763	551	677	710	469	233	324	860
Mostly As and Bs	(.2)	(.4)	(.3)	(.7)	(.5)	(.6)	(.5)	(.4)	(.6)	(.8)	(1.4)	(1.2)
Mostly Ds and Fs	(.2)	(.4)	(.3)	(.7)	(.5)	(.6)	(.5)	(.4)	(.6)	(.8)	(1.8)	(1.3)

Standard errors are in parentheses.

Exhibit 4-2
(STUDENT RETENTION, BY DISABILITY CATEGORY)

	All	LD	SP	MR	SED	HI	VI	OI	OHI	AUT	TBI	MULT
Ever retained at grade level	9,168	1,035	826	816	847	990	755	961	916	964	342	680
	(.2)	(.4)	(.3)	(.7)	(.5)	(.6)	(.5)	(.4)	(.6)	(.8)	(1.4)	(1.2)

Standard errors are in parentheses.

Exhibit 4-3
(WJIII PASSAGE COMPREHENSION, BY DISABILITY CATEGORY)

	Total	LD	SP	MR	SED	HI	VI	OI	OHI	AUT	TBI	MULT
WJIII Passage Comprehension (percentile)	3,912	457	367	392	363	483	253	416	469	377	127	203
0-25	(1.9)	(3.0)	(3.6)	(1.9)	(3.7)	(3.5)	(4.9)	(3.8)	(3.5)	(3.8)	(6.3)	(4.5)
26-50	(1.6)	(2.7)	(3.4)	(1.6)	(3.3)	(2.9)	(4.3)	(3.1)	(3.0)	(3.0)	(5.1)	(3.8)
51-75	(1.1)	(1.5)	(2.6)	(0.8)	(2.2)	(2.1)	(3.7)	(2.6)	(2.2)	(2.2)	(4.2)	(2.1)
76+	(.8)	(1.1)	(2.0)	(0.7)	(1.7)	(1.8)	(2.9)	(2.0)	(1.5)	(1.8)	(1.8)	(1.7)

Standard errors are in parentheses.

Exhibit 4-4
(WJIII MATHEMATICS CALCULATION, BY DISABILITY CATEGORY)

	Total	LD	SP	MR	SED	HI	VI	OI	OHI	AUT	TBI	MULT
WJIII Mathematics Calculation (percentile)	3,649	446	354	342	351	464	240	385	450	331	115	167
0-25	(1.9)	(3.4)	(3.0)	(2.8)	(3.9)	(3.6)	(4.5)	(4.0)	(3.6)	(4.6)	(7.4)	(6.0)
26-50	(1.8)	(3.2)	(3.4)	(2.4)	(3.6)	(3.4)	(4.4)	(3.5)	(3.3)	(4.1)	(6.0)	(4.8)
51-75	(1.4)	(2.1)	(3.2)	(1.3)	(3.1)	(2.9)	(4.3)	(3.2)	(2.4)	(3.0)	(4.8)	(3.0)
76+	(1.4)	(2.0)	(3.1)	(1.0)	(2.1)	(2.9)	(4.3)	(2.8)	(2.2)	(2.9)	(4.9)	(3.3)

Standard errors are in parentheses.

Exhibit 4-5
(AVERAGE GRADE LEVELS BEHIND IN READING AND MATHEMATICS, BY DISABILITY CATEGORY)

	Total	LD	SP	MR	SED	HI	VI	OI	OHI	AUT	TBI	MULT
Reading	5,286	637	530	527	467	649	418	527	451	549	195	303
	(.2)	(.4)	(.3)	(.7)	(.5)	(.6)	(.5)	(.4)	(.6)	(.8)	(1.4)	(1.2)
Math	5,244	632	521	526	463	645	414	520	446	544	194	306
	(.2)	(.4)	(.3)	(.7)	(.5)	(.6)	(.5)	(.4)	(.6)	(.8)	(1.8)	(1.3)

Standard errors are in parentheses.

Exhibit 5–1
(PARENTS' RATINGS OF SOCIAL SKILLS OF STUDENTS WITH DISABILITIES AND STUDENTS IN THE GENERAL POPULATION)

	Students with Disabilities		Students in the General Population	
	Never	Very often	Never	Very often
	9,538		655	
Make friends easily	(.6)	(1.2)	(.5)	(1.9)
Avoid situations that are likely to result in trouble	(.7)	(1.2)	(.8)	(2.0)
Speak in an appropriate tone of voice at home	(.6)	(1.2)	.5	2.0
Start conversations rather than waiting for others to start	(.7)	(1.2)	(1.0)	(1.9)
Seem confident in social situations, such as parties or group outings	(.7)	(1.2)	(1.0)	(2.0)
Cooperate with family members without being told to do so.	(.6)	(1.2)	(.6)	(1.9)
Control temper when arguing with other children	(.8)	(1.2)	(1.1)	(1.8)
End disagreements with parent calmly	(.9)	(1.1)	(1.2)	(1.8)
Join group activities, such as a group having lunch together, without being told to do so.	(1.1)	(1.1)	(1.0)	(1.9)
Receive criticism well	(1.1)	(.9)	(1.5)	(1.5)

Standard errors are in parentheses.

Exhibit 5-2
(TEACHERS' RATINGS OF SOCIAL SKILLS OF STUDENTS WITH DISABILITIES AND STUDENTS IN THE GENERAL POPULATION)

	Students with Disabilities		Students in the General Population	
	Never	Very often	Never	Very often
	6,053		901	
Easily transition between classroom activities	(1.0)	(2.1)	(.8)	(1.6)
Follow teacher directions	6,063			
	(.6)	(2.1)	(.4)	(1.6)
Control temper in conflict situations with peers	6,019			
	(1.4)	(2.1)	(1.0)	(1.7)
Cooperate with peers without prompting	6,050			
	(1.1)	(2.1)	(.7)	(1.7)
Act sad or depressed	6,058			
	(2.1)	(1.1)	(1.6)	(.8)
Fight with others	6,045			
	(2.1)	(1.2)	(1.6)	(.8)
Get easily distracted	6,067			
	(1.0)	(2.1)	(1.6)	(1.4)

Standard errors are in parentheses.

Exhibit 5-3
(STUDENTS GET ALONG WITH TEACHERS AND OTHER STUDENTS)

	Very well	Pretty well	Not very well	Not at all well	Sample Size
Get along with teachers	(1.2)	(1.1)	(.6)	(.3)	9,297
Get along with students	(1.2)	(1.2)	(.7)	(.3)	9,106

Standard errors are in parentheses.

Exhibit 5-4
(SOCIAL INTERACTIONS OF STUDENTS WITH DISABILITIES)

	Sample Size	Standard Error
Participate in an extracurricular school group	9,669	(1.1)
Participate in an out-of-school group	9,707	(1.2)
Participate in any extracurricular school or out-of-school group	9,707	(1.1)
Get together with friends outside of school or organized groups:	8,338	
Frequently (four or more times a week)		(1.1)
Regularly (one to three times a week)		(1.3)
Occasionally (less than once a week)		(1.1)
Never		(.8)
Are socially engaged—get together with friends at least once a week or belong to at least one group	8,324	(.9)

Standard errors are in parentheses.

Exhibit 5-6
(RELATIONSHIP OF SOCIAL SKILLS TO OTHER INDICATORS OF SOCIAL ADJUSTMENT)

	Social Skills Rated as:		
	Low	Medium	High
Percentage with classroom social behaviors rated:		4782	
Low	(.8)	(.3)	(.1)
Medium	(2.6)	(2.1)	(5.5)
High	(2.5)	(2.1)	(5.5)
How well students get along with others		8828	
Not well	(1.2)	(.4)	(.5)
Well or very well	(2.1)	(,9)	(1.1)
Percentage who:		9524	
Belong to a group	(2.2)	(1.4)	(3.3)
		8289	
See friends outside of groups at least weekly	(2.4)	(1.6)	(3.7)
		9515	
Have been the subject of a disciplinary action at school in the past year	(1.8)	(1.0)	(1.7)

Standard errors are in parentheses.

Exhibit 5-7
(SOCIAL ADJUSTMENT OF STUDENTS, BY DISABILITY CATEGORY)

	LD	SP	MR	SED	HI	VI	OI	OHI	AUT	TBI	MULT
Social skills scale score:	1,030	822	860	843	1,013	797	964	920	1,092	351	808
High	(1.3)	(1.7)	(1.0)	(.8)	(1.5)	(2.0)	(1.6)	(1.3)	(0.6)	(2.0)	(1.2)
Medium	(2.1)	(2.2)	(2.4)	(2.3)	(2.4)	(2.9)	(2.4)	(2.5)	(2.4)	(4.8)	(2.7)
Low	(1.9)	(1.8)	(2.3)	(2.3)	(2.2)	(2.6)	(2.1)	(2.4)	(2.4)	(4.7)	(2.7)
Classroom social behavior scale score:	690	569	622	515	714	491	595	488	689	224	425
High	(2.4)	(2.9)	(2.4)	(2.0)	(3.0)	(2.8)	(3.1)	(2.9)	(2.6)	(5.4)	(3.7)
Medium	(2.5)	(2.9)	(2.5)	(2.1)	(3.0)	(3.9)	(3.1)	(3.0)	(2.7)	(5.4)	(3.8)
Low	(.4)	(.5)	(.6)	(.7)	(.4)	(.9)	(.6)	(.9)	(.6)	(.4)	(1.4)
Belong to a group or get together with friends at least weekly	1,044 (1.6)	838 (1.7)	859 (2.1)	869 (2.0)	1,024 (2.0)	810 (2.7)	990 (2.2)	924 (1.7)	1,101 (2.4)	355 (4.3)	843 (2.5)
Have been subject to disciplinary action at school	477 (1.6)	416 (1.1)	442 (1.8)	331 (2.3)	521 (1.4)	388 (1.3)	454 (1.3)	362 (1.9)	494 (1.2)	140 (3.5)	320 (1.9)
Have been arrested	340 (1.0)	81 (2.4)	238 (1.2)	266 (2.6)	264 (1.6)	167 (.3)	204 (1.1)	323 (1.6)	174 (.9)	90 (2.9)	214 (2.2)

Standard errors are in parentheses.

Exhibit 6-1
SELF-CARE SKILLS

Feed themrselve without help	9,036
Very well	(.8)
Pretty well	(.7)
Not very or not at all well	(.4)
Dress themselves without help	9,041
Very well	(1.0)
Pretty well	(.9)
Not very or not at all well	(.6)
Self-care scale score	9,036
High (8)	(1.0)
Medium (5 to 7)	(1.0)
Low (2 to 4)	(.3)

Standard errors are in parentheses.

Exhibit 6-2 (FUNCTIONAL COGNITIVE SKILLS)	
Read and understand common signs	9,512
Very well	(1.1)
Pretty well	(.9)
Not very well	(.6)
Not at all well	(.5)
Tell time on an analog clock	9,495
Very well	(1.2)
Pretty well	(1.1)
Not very well	(1.0)
Not at all well	(.7)
Count change	9,503
Very well	(1.2)
Pretty well	(1.1)
Not very well	(1.0)
Not at all well	(.6)
Look up telephone numbers and use the phone	8,897
Very well	(1.1)
Pretty well	(1.1)
Not very well	(1.0)
Not at all well	(1.0)
Functional cognitive skills scale score	8,897
High (15 or 16)	(1.0)
Medium (9 to 14)	(1.2)
Low (4 to 8)	(.8)
Standard errors are in parentheses.	

Exhibit 6-3 (MOBILITY)	
Students age 12 or older get places outside the home:	2,360
Very well	(2.2)
Pretty Well	(1.5)
Not very well	(1.2)
Not at all well	(1.5)
Mobility scale score for students with visual impairments	
High (24-30)	(5.0)
Medium (16-23)	(4.7)
Low (10-16)	(3.1)
Standard errors are in parentheses.	

Exhibit 6-4 (PERSISTENCE AND SELF-ADVOCACY SKILLS)	
Keep working at something until finished	9,547
Very often	(1.1)
Sometimes	(1.2)
Never	(.9)
Ask for what they need to do their best in class	6,060
Very often	(1.4)
Sometimes	(1.5)
Never	(1.2)
Standard errors are in parentheses.	

Exhibit 6-5 HOUSEHOLD RESPONSIBILITIES	
Fixes own breakfast or lunch	9,559
Always	(.9)
Usually	(.9)
Sometimes	(1.2)
Never	(.9)
Straightens up own room/living area	9,563
Always	(1.0)
Usually	(.9)
Sometimes	(1.2)
Never	(.9)
Do laundry	9,548
Always	(.5)
Usually	(.5)
Sometimes	(1.0)
Never	(1.1)
Household responsibilities scale score	9,548
High (15 or 16)	(.4)
Medium (9 to 14)	(1.2)
Low (4 to 8)	(1.2)
Standard errors are in parentheses.	

Exhibit 6-6
(DAILY LIVING SKILLS, BY DISABILITY CATEGORY)

	LD	SP	MR	SED	HI	VI	OI	OHI	AUT	TBI	MULT
Self-care skills scale score											
High (8)	(1.7)	(1.6)	(2.3)	(2.2)	(2.1)	(3.0)	(2.4)	(2.5)	(2.3)	(4.7)	(2.5)
Medium (5 to 7)	(1.7)	(1.6)	(2.4)	(2.3)	(2.3)	(3.1)	(2.8)	(2.5)	(2.6)	(4.9)	(2.8)
Low (2 to 4)	(.3)	(.2)	(1.1)	(.7)	(.6)	(1.8)	(1.9)	(.9)	(1.3)	(3.1)	(2.2)
Functional cognitive skills scale score											
High (15 or 16)	(1.8)	(2.2)	(1.1)	(2.1	(2.1)	(2.2)	(2.0)	(2.2	(1.4)	(2.9)	(1.5)
Medium (9 to 14)	(2.0)	(2.3)	(2.4)	(2.3)	(2.6)	(3.2)	(2.7)	(2.5)	(2.6)	(4.8)	(2.7)
Low (4 to 8)	(1.1)	(1.2)	(2.3)	(1.4)	(1.6)	(2.7)	(2.1)	(1.7)	(2.4)	(4.3)	(2.7)
Get around outside the house:	380	87	242	279	256	167	200	307	146	86	195
Very well	(3.0)	(6.7)	(4.4)	(3.9)	(5.7)	(6.5)	(5.0)	(3.4)	(6.7)	(9.9)	(5.3)
Not at all well	(2.2)	(4.9)	(3.2)	(2.5)	(3.5)	(5.8)	(4.3)	(1.5)	(7.1)	(5.9)	(5.3)
Keep working at something until finished:	1,031	823	842	861	1,012	797	965	921	1,092	349	810
Very often	(2.0)	(2.3)	(2.1)	(2.0)	(2.5)	(3.0)	(2.4)	(2.1)	(2.2)	(4.3)	(2.4s)
Sometimes	(2.1)	(2.4)	(2.4)	(2.3)	(2.7)	(3.0)	(2.7)	(2.5)	(2.7)	(4.9)	(2.8)
Never	(1.6)	(1.4)	(2.0)	(2.0)	(1.5)	(2.2)	(1.8)	(2.1)	(2.0)	(4.3)	(2.4)
Ask for what they need to do their best in class:	693	570	620	516	714	493	593	492	675	224	422
Very often	(2.5)	(2.8)	(2.6)	(2.4)	(3.0)	(3.7)	(3.1)	(3.1)	(2.2)	(5.4)	(3.6)
Sometimes	(2.7)	(2.9)	(2.8)	(3.0)	(3.1)	(3.9)	(3.2)	(3.5)	(3.2)	(5.8)	(4.0)
Never	(2.0)	(2.1)	(2.2)	(2.6)	(2.4)	(3.0)	(2.6)	(3.1)	(3.0)	(4.5)	(3.7)
Household responsibilities scale score:											
High (15 or 16)	(.8)	(.6)	(.6)	(.5)	(.7)	(.6)	(.4)	(.7)	(.2)	(1.0)	(.6)
Medium (9 to 14)	(2.1)	(2.3)	(2.2)	(2.2)	(2.7)	(2.8)	(2.2)	(2.3)	(1.9)	(4.4)	(2.1)
Low (4 to 8)	(2.1)	(2.3)	(2.2)	(2.2)	(2.5)	(2.8)	(2.1)	(2.3)	(1.8)	(4.4)	(2.2)
Locus of control scale score:	361	278	288	302	365	183	330	386	244	98	138
High	(3.8)	(4.2)	(3.8)	(4.2)	(4.3)	(5.6)	(4.4)	(3.9)	(5.6)	(7.8)	(7.7)
Medium	(3.8)	(4.2)	(4.2)	(4.0)	(4.3)	(5.6)	(4.3)	(3.9)	(5.5)	(8.1)	(7.6)
Low	(3.8)	(4.2)	(3.8)	(4.2)	(4.3)	(5.6)	(4.4)	(3.9)	(5.6)	(7.8)	(7.7)

Standard errors are in parentheses.