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SEELS

BEHIND THE LABEL: THE FUNCTIONAL IMPLICATIONS OF DISABILITY

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1. INTRODUCTION

By Mary Wagner and Jose Blackorby

At the levels of both policymaking and everyday instruction, it is important to understand the mix of attributes, skills, and challenges that students bring to the classroom. In the case of students receiving special education services, the functional framework defined by the eligibility criteria for a disability category specifies the ways in which a student's functioning may be limited. Understanding functionality aids educators and parents in developing appropriate Individualized Education Plans (IEPs) and strategies for delivering educational services. The disability classification system specified in federal law is imperfect and its utility has been debated for decades. However, there is little doubt that a student's disability category label, taken alone, fails to identify the range of domains in which students may have challenges or strengths that influence their ability to succeed.

The Special Education Elementary Longitudinal Study (SEELS)—a national study of the characteristics, experiences, and achievements of students with disabilities in elementary and middle school—is making information available on many facets of the functioning of students with disabilities. This report takes a broad look at student functioning that goes beyond their disability label, including students' health, sensory functioning, communication, daily living skills, and social skills. It presents information gathered from parents and guardians¹ of SEELS students through telephone interviews and a mail survey conducted in 2000-01.

An Overview of SEELS²

SEELS addresses key topics with information from a sample that represents students receiving special education in elementary and middle schools nationally. The more than 12,000 SEELS students were chosen so that they represent students receiving special education who were ages 6 to 12 on September 1, 1999, and receiving special education in first grade or higher. Findings represent students as a whole and students in each of the 12 federal special education disability categories used nationally. We know that students receiving special education differ from the general population of students in important ways; however, we also know that they differ from each other on many dimensions just as significantly (see, for example, Wagner et al., 1991). Disability differences are dramatic; students with visual impairments, for example, have markedly different experiences in school and in their postschool years than do students with mental retardation (Wagner, 1993; Wagner, D'Amico, Marder, Newman, & Blackorby, 1992). A key value of SEELS is its ability to depict these important differences for students nationally.

Another extremely valuable aspect of SEELS is its longitudinal design. SEELS will collect information for students three times over a 4-year period, years in which students go through important changes related to their physical, emotional, and cognitive development. We will be able to document the changes that accompany their development and identify early experiences that contribute to more positive results as students age and progress in school. Finally, SEELS

¹ For simplicity, parents and guardians are referred to here as parents.

² More details of the SEELS design and methods are presented in the appendix.

brings to bear information that represents the perspectives of both parents and schools to address a wide range of topics.

The issues addressed in this report are an important part of the wide array of issues about which SEELS will provide information in the coming years. The SEELS conceptual framework, presented in Exhibit 1-1, shows the comprehensive look at students' experiences that SEELS will support. Understanding student functioning across multiple domains represents an important step in a progression of analyses and reports that will go on to depict school programs and services over time, including such key issues as students' access to the general education curriculum and their participation in standardized testing. Experiences of children outside of school, including their participation in friendships, social activities, and the community, also will be a SEELS focus. The achievements of students in and out of school will be of crucial concern, as will identifying the aspects of students, households, school programs, and nonschool experiences that contribute to more positive results for students over time.

To support this ambitious analysis agenda, parent interview/survey data, such as we report here, will be collected again in 2002 and 2004. In 2001, we conducted direct assessments of students' academic performance in reading, mathematics, and academic problem-solving, and interviewed students regarding their self-concept and attitudes toward school. Finally, school staff surveys that capture important aspects of students' schools and individual educational programs were conducted in 2001. All of these data collections will be repeated in 2002 and 2004 to track change over time. The rich, wide-ranging view of elementary and middle school students as they age that SEELS will provide will support informed policy-making and improved practice for students with disabilities.

Focus of This Report

The SEELS conceptual framework is extremely comprehensive and addresses many aspects of students' experiences in and out of school. We are organizing the presentation of SEELS findings into reports that focus on specific themes (e.g., student characteristics, programs, results). In this report, we address student functioning in several domains. Students approach their educational experiences from a complex background that is shaped by many factors, some related and some unrelated to their disability. The combination of these factors influences students' success in school-related tasks and in their social development. Understanding these influential characteristics of students receiving special education is a crucial foundation for being able to serve them well.

Our look at the students receiving special education in elementary and middle school addresses the following questions:

What are their functional abilities in the physical, communication, sensory, social, and independence domains?

- What strengths do students bring to the educational process?
- How do these factors differ for students with different characteristics and from students in the general population?

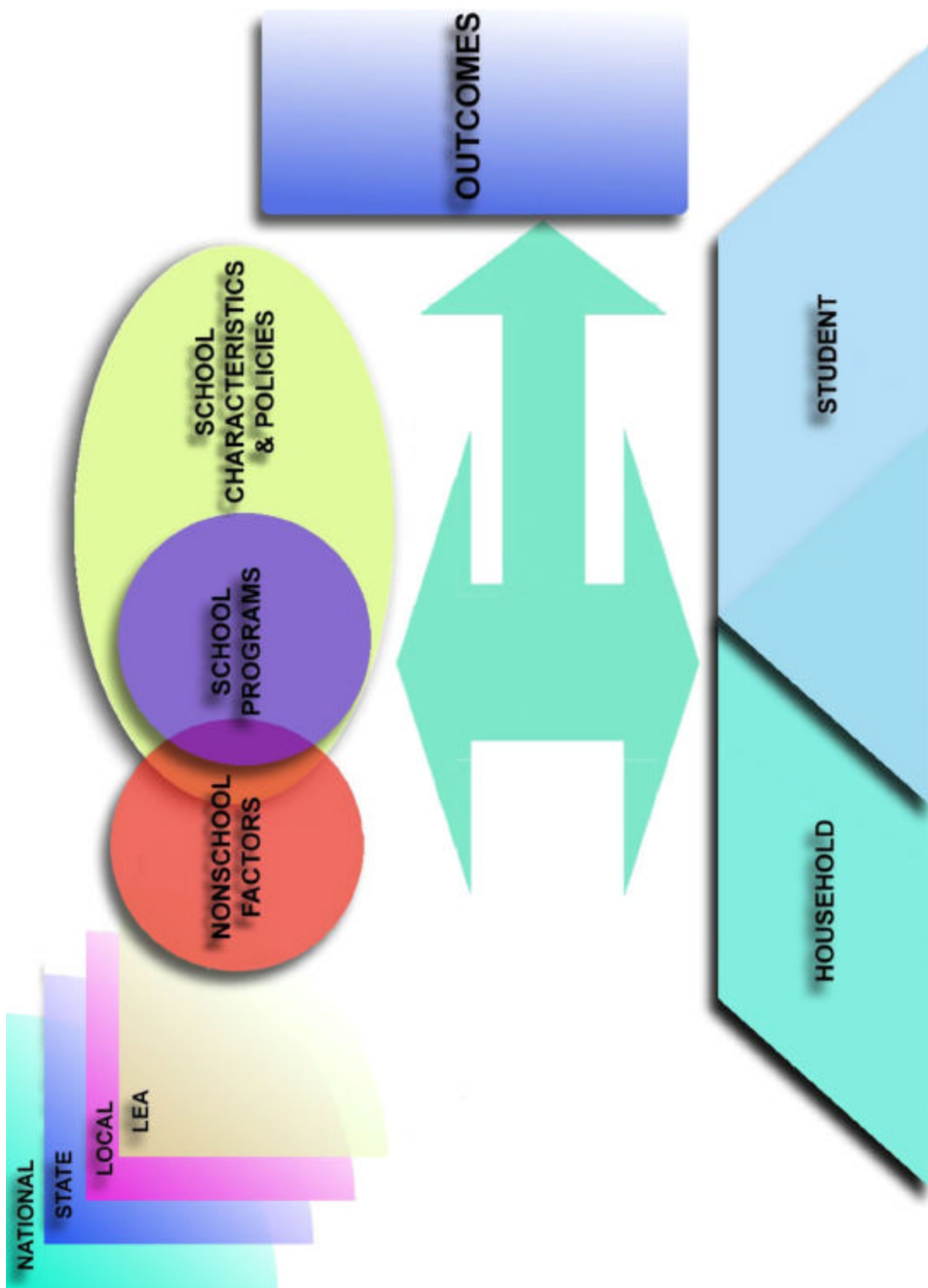


Exhibit 1-1
SEELS CONCEPTUAL FRAMEWORK

Findings that address these questions are presented in several ways. First, we present the mean of continuous variables (e.g., the average age of students) or the overall frequency distribution of categorical variables (i.e., the weighted percentage of respondents who indicated each category). For multicategory variables, the percentages add to 100% as one reads down the columns in tables. We then present the distribution of each variable for important subgroups of students, including those who differ in their primary disability category and, often, other characteristics.

Readers should remember the following issues when examining the data tables.

Results are weighted. All of the descriptive statistics presented in this report are weighted estimates of the national population of students receiving special education ages 6 to 13, as well as each disability category individually.

Standard errors. For each mean and percentage in this report, we present a standard error (usually presented in parentheses), which describes the precision of the estimate. For example, a variable with a weighted estimated value of 50% and a standard error of 2 means that the value for the total population, if it had been measured, would lie between 48% and 52% (plus or minus 2 percentage points of 50%). Thus, small 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 or racial/ethnic group). Groups with very small samples will have comparatively large standard errors. In SEELS, for example, there are relatively few students with deaf-blindness (n=49), so estimates for that group have relatively large standard errors. Therefore, readers should be cautious in interpreting results for this group and others with small sample sizes.

Organization of This Report

Chapter 2 describes the disability classifications and demographic characteristics of students with disabilities. These findings illustrate important ways in which students with disabilities were both similar to, and different from their peers without disabilities, as well as ways that they differed from each other. These findings provide an important lens through which to examine and interpret students' experiences and achievements. Chapter 3 delves into students' functional skills in the physical, sensory, and communication domains. Daily living and social skills are considered in Chapter 4, as are parents' reports of students' strengths. We conclude with a discussion of some of the themes that have emerged from the findings presented here.

2. DEMOGRAPHIC CHARACTERISTICS OF ELEMENTARY AND MIDDLE SCHOOL STUDENTS RECEIVING SPECIAL EDUCATION

By Camille Marder and Mary Wagner

Understanding the characteristics of the students receiving special education is a crucial foundation for serving them well. Students bring to their educational experiences a complex history and background that is shaped by demographic characteristics, such as age, gender, and ethnicity; by family background and circumstances, such as parents' education and household income; and by the nature of the students' disabilities. These factors help structure students' involvement at home, at school, and in the community, as well as the ways in which students, parents, school staff, and other service personnel work together toward positive results for students. Thus, student and household characteristics are essential elements of the context for many major life experiences of students. In important ways, an understanding of that context will inform how we understand and interpret students' experiences, including the home learning experiences, friendships, and extracurricular activities that are reported here.

A brief summary of selected individual and household characteristics of students with disabilities is presented below.³

Individual Characteristics

The nature of a student's disability can be a powerful influence on his or her experiences, both in and out of school. However, other fundamental characteristics of students, whether or not they have disabilities, also helps shape their development, relationships, experiences, and achievements. For young people, age is a major determinant of development and influences both children's competence and their independence. Gender is a defining characteristic of human beings and has both obvious and subtle influences on the ways children grow up. In addition, racial/ethnic background can be associated with rich cultural traditions and patterns of relationships within families and communities that can generate important differences in values, perspectives, expectations, and practices regarding children.

The importance of understanding the demographic makeup of the population of students receiving special education cannot be overemphasized; it is crucial in interpreting SEELS findings for the group as a whole and for students with particular disability classifications. It also is a foundation for interpreting comparisons between students receiving special education and those in the general population.

Below, we report the primary disability classifications among elementary and middle school students receiving special education and describe other traits that are important to their experiences, including their age, gender, and race/ethnicity. These are presented for students with disabilities as a whole, compared with the general student population when possible, and then described as they vary for students with different primary disability classifications.

³ A more detailed discussion of these characteristics can be found in Wagner, Marder, & Blackorby (2002).

Students' Primary Disabilities

In the 1999-2000 school year, students who received special education constituted 11.4% of all 6- to 13-year olds who were enrolled in school. Exhibit 2-1 depicts the primary disability classifications assigned by schools to those students (Office of Special Education Programs, 2001a).

Almost three-fourths of students in this age group who were receiving special education were classified as having a learning disability (43%) or speech impairment (30%, Exhibit 2-1). Thus, when findings are presented for students with disabilities as a whole, they represent largely the experiences of students with learning and speech/language disabilities. Other disability classifications included mental retardation (9%), emotional disturbances (6%), and other health impairments (4%). The seven remaining disability categories each were fewer than 2% of students.

Exhibit 2-1 DISABILITY CATEGORY DISTRIBUTION OF CHILDREN RECEIVING SPECIAL EDUCATION, AGES 6 TO 13			
Primary Disability Classification	Federal Child Count ⁴		SEELS Weighted
	Number	Percentage	Percentage
Specific learning disability	1,428,939	43.20	41.54
Speech/language impairment	1,002,090	30.30	32.72
Mental retardation	292,833	8.82	8.84
Emotional disturbance	204,725	6.19	5.92
Hearing impairment	39,922	1.21	1.20
Visual impairment	14,658	.44	.45
Orthopedic impairment	42,406	1.28	1.29
Other health impairment	149,037	4.51	4.52
Autism	47,064	1.42	1.50
Traumatic brain injury	6,379	.19	.19
Multiple disabilities	59,685	1.80	1.80
Deaf-blindness	1,025	.03	.03
Developmental delay ⁵	19,304	.58	--
TOTAL	3,307,067	100.00	100.00

The weighted distribution of SEELS students very closely approximates that of the Federal Child Count. Thus, weighted findings from SEELS provide an accurate picture of the characteristics, experiences, and achievements of children receiving special education for the range of disabilities highlighted in Exhibit 2-1.

Age

Students represented in SEELS were not distributed evenly across the ages from 6 to 13 (Exhibit 2-2). Whereas the general population of 6- to 13-year olds contains roughly the same percentage of children of each single year of age, in the population represented by

SEELS, 6- and 13-year-olds constituted only 6% and 3% of the population, respectively. This uneven distribution is largely the result of some 6-year-olds becoming 7 and some 12-year-olds becoming 13 between the time they were selected for the sample and the time when data were collected, making the 6-year-old and 13-year-old cohorts smaller than others.

⁴ Data are for children ages 6 to 13 who were receiving services under IDEA, Part B, in the 1999-2000 school year in the 50 states and Puerto Rico (OSEP, 2001a).

⁵ Students ages 8 and younger who were classified by school districts as having a developmental delay were reassigned to other categories for purposes of weighting the SEELS sample, using information from parent interviews. Schools also will reassign them when they reach age 9 if they continue to receive special education.

Exhibit 2-2 AGE, BY DISABILITY CATEGORY

Age	All Students	Learning Disability	Speech/ Language Impair- ment	Mental Retarda- tion	Emotional Disturb- ance	Hearing Impair- ment	Visual Impair- ment	Ortho- pedic Impair- ment	Other Health Impair- ment	Autism	Traumatic Brain Injury	Multiple Dis- abilities	Deaf - Blindness
6 or 7	18.4 (1.0)	6.6 (1.0)	35.4 (2.2)	15.3 (1.7)	12.3 (1.5)	17.7 (2.1)	18.3 (2.3)	23.2 (2.2)	13.1 (1.7)	28.2 (2.4)	13.9 (3.3)	22.6 (2.3)	7.6 (8.9)
8	14.9 (.9)	11.7 (1.4)	20.4 (1.9)	12.3 (1.5)	11.6 (1.5)	17.1 (2.0)	17.2 (2.3)	15.8 (1.9)	13.1 (1.7)	17.3 (2.0)	16.1 (3.5)	14.8 (1.9)	8.3 (9.3)
9	15.7 (.9)	14.9 (1.5)	15.2 (1.7)	17.4 (1.8)	18.9 (1.8)	15.0 (1.9)	17.2 (2.3)	19.3 (2.1)	15.6 (1.8)	19.9 (2.1)	14.6 (3.4)	14.9 (1.9)	12.7 (11.2)
10	18.0 (.9)	21.2 (1.7)	14.5 (1.6)	15.9 (1.7)	19.2 (1.8)	18.1 (2.1)	16.9 (2.3)	16.3 (1.9)	17.7 (1.9)	14.5 (1.9)	20.0 (3.9)	19.1 (2.1)	43.8 (16.6)
11	17.2 (.9)	23.4 (1.8)	8.5 (1.3)	20.4 (1.9)	17.6 (1.8)	14.3 (1.9)	15.3 (2.2)	13.1 (1.8)	21.6 (2.1)	12.0 (1.7)	20.3 (3.9)	13.7 (1.9)	21.7 (13.8)
12 or 13	15.8 (.9)	22.2 (1.7)	6.0 (1.1)	18.7 (1.8)	20.4 (1.9)	17.8 (2.1)	15.2 (2.2)	12.4 (1.7)	19.0 (2.0)	8.3 (1.5)	15.1 (3.5)	14.9 (1.9)	5.9 (7.9)
Sample size	9,744	1,050	837	867	875	1,033	815	990	923	1,101	361	843	49

Standard errors are in parentheses.

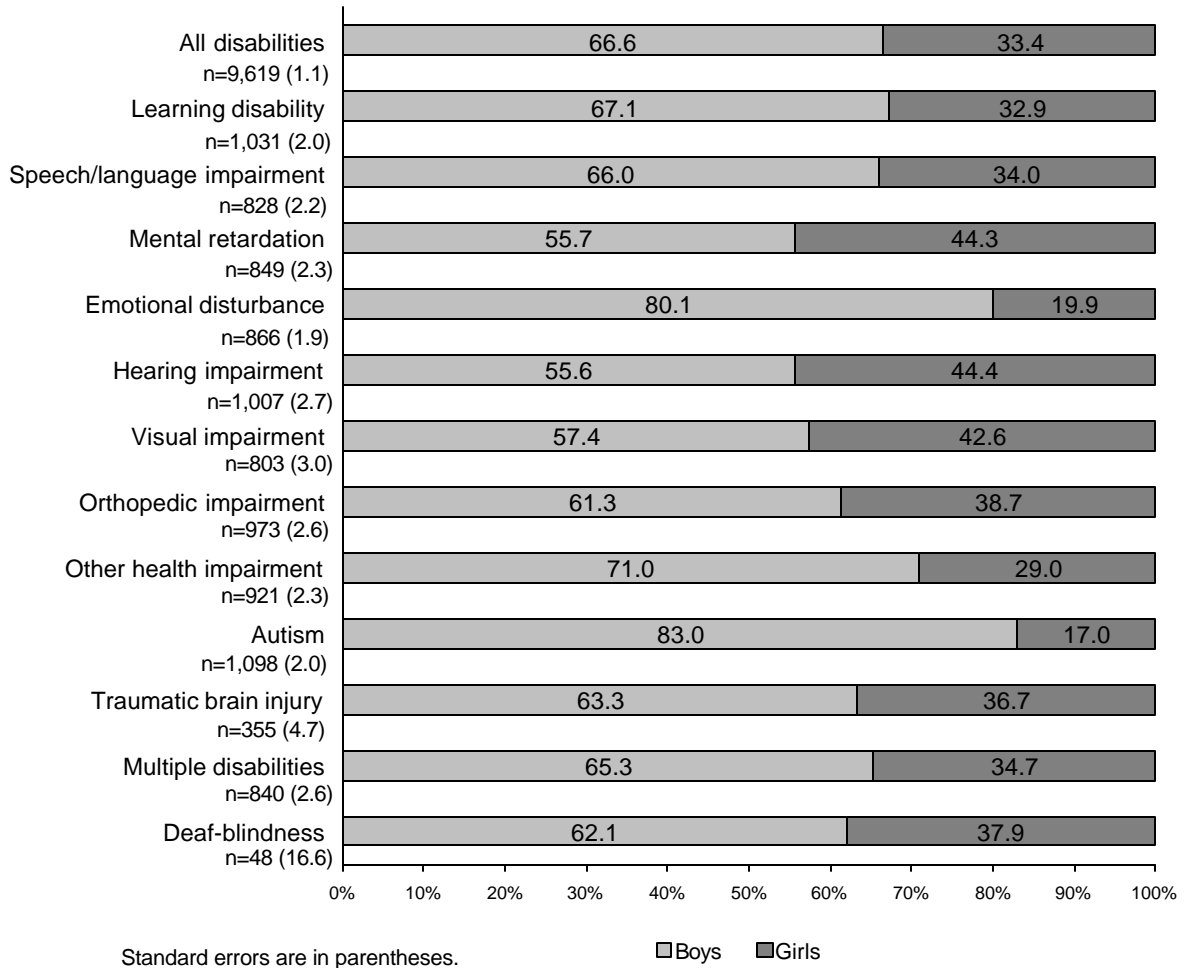
Differences in the age distributions of students in different disability categories were marked and should be noted in interpreting findings for those groups. For example, the identification of many speech and language disabilities at young ages resulted in students in that category being younger as a group; more than half of them were less than 9 years old, compared with fewer than one in five students with learning disabilities and about one in three students with hearing impairments ($p < .001$). At the other end of the continuum were students with deafness/blindness, most of whom were 10 or 11 years old. Students with learning disabilities or emotional disturbances also tended to be older than students with many other classifications. Thus, we are likely to see that activities that were more common among younger students also were more common among students with speech/language impairments and that those that were more common among older students also were more prevalent among students with learning disabilities or emotional disturbances, for example.

Gender

Approximately two-thirds of elementary and middle school students with disabilities, were boys and one-third were girls (Exhibit 2-3), whereas boys in this age group are about 51% of the general population. The 2:1 ratio among children with disabilities has been found among infants and toddlers (Hebbeler et al., 2001), as well as among high-school age students (Marder & Cox, 1991).

For most disability classifications, boys made up between 60% and 71% of the population, but among students with emotional disturbances or autism, they were at least 80% of the population. In contrast, among students with mental retardation or hearing or visual impairments, the percentages were more balanced, with boys comprising 56% to 57% of the population. Thus, the experiences of students in different disability categories may differ because of the gender differences between categories as well as the differences in disability.

Exhibit 2-3 STUDENT GENDER, BY DISABILITY CATEGORY



Race/Ethnicity

Elementary and middle school students receiving special education differed in some respects from the general population in terms of their racial/ethnic backgrounds (Exhibit 2-4). Although white students made up approximately the same percentage of students receiving special education (63%) as they did of the general population of same-age students (61%), differences were apparent between the two populations for African American students. African Americans constituted 19% of students with disabilities, compared with 17% of students in the general population ($p < .05$). In contrast, Hispanics were a smaller proportion of the population of students receiving special education relative to students as a whole (14% vs. 16%, $p < .001$).

Exhibit 2-4

STUDENTS' RACIAL/ETHNIC BACKGROUNDS, BY DISABILITY CATEGORY

Percentage whose race/ ethnicity was:	All Students	Learning Disability	Speech/ Language Impair- ment	Mental Retarda- tion	Emotional Disturb- ance	Hearing Impair- ment	Visual Impair- ment	Ortho- pedic Impair- ment	Other Health Impair- ment	Autism	Traumatic Brain Injury	Multiple Dis- abilities	Deaf- Blind- ness
White	63.2 (1.2)	62.2 (2.0)	66.7 (2.2)	53.5 (2.3)	56.9 (2.3)	64.3 (2.6)	62.4 (2.9)	65.0 (2.5)	77.0 (2.1)	66.0 (2.5)	57.0 (4.8)	53.2 (2.7)	60.9 (16.4)
African American	19.2 (.9)	17.9 (1.6)	15.7 (1.7)	34.7 (2.2)	27.0 (2.1)	14.4 (1.9)	17.7 (2.3)	17.5 (2.0)	13.1 (1.7)	16.9 (2.0)	28.1 (4.3)	30.5 (2.5)	9.8 (9.9)
Hispanic	13.7 (.8)	16.4 (1.6)	12.5 (1.5)	8.9 (1.3)	12.8 (1.6)	16.0 (2.0)	15.0 (2.2)	14.5 (1.8)	7.2 (1.3)	11.0 (1.7)	11.1 (3.0)	14.1 (1.9)	18.5 (13.0)
Asian/Pacific Islander	1.6 (.3)	.7 (.4)	2.7 (.8)	1.5 (.6)	.6 (.4)	4.0 (1.1)	3.3 (1.1)	2.0 (.7)	.4 (.3)	4.5 (1.1)	2.1 (1.4)	1.3 (.6)	2.0 (4.7)
American Indian/ Alaska Native	.7 (.2)	.9 (.4)	.4 (.3)	.3 (.3)	1.1 (.5)	.6 (.4)	.4 (.4)	.2 (.3)	.9 (.5)	.5 (.4)	1.3 (1.1)	.2 (.3)	7.9 (9.0)
Sample size		1,050	835	866	875	1,033	815	990	923	1,101	360	842	49

Standard errors are in parentheses.

The disproportionality of minorities among students with disabilities concentrated in a few categories. Whereas the racial/ethnic composition of students with learning disabilities or speech, hearing, visual, or orthopedic impairments resembled the general population, African Americans comprised significantly larger percentages of students with mental retardation (35%), emotional disturbances (27%), multiple disabilities (30%), and traumatic brain injuries (28%). Hispanic students were the smallest proportions of those with mental retardation and other health impairments (7% and 9%; $p < .001$). These racial/ethnic differences between disability category may contribute to differences in students' experiences, apart from their differences in disability.

Household Risk Factors

A child's household is his or her first educational setting. At home, children form their first emotional attachments, achieve their early developmental milestones, and acquire the foundation for their subsequent growth and learning. As important as the home setting is for all children, the disabilities of students receiving special education may make them particularly in need of attention, support, resources, and advocates at home. At the same time, their disabilities and the needs that accompany them may create added demands and stresses for others in the households. Thus, the already complex dynamic of households with children can be made even more complex by the added element of a child's disability. How families respond to that complexity can influence the very nature of students' childhood years.

Next we examine several aspects of households that can be risk factors in children's development: living with other than two parents, having a poorly educated or unemployed head of household, or living in a low-income household. These factors are described for students with

disabilities as a whole compared with the general student population, and then for students who differ in their primary disability classification.

Household Risk Factors for Students with Disabilities and the General Population

Like students in the general population, a large majority of students with disabilities (70%) lived in households with two parents (either biological, step, or adoptive parents, Exhibit 2-5). Another 23% lived with one parent. Thus, 93% of students with disabilities were living with a parent. An additional 4% lived with other adult family members in households that did not include one of their own parents, a rate higher than the general population (3%, $p < .05$). One percent of students with disabilities lived in foster care, a rate twice as high as children in the general population ($p < .05$; U.S. Department of Health and Human Services, 2001). The rate

Exhibit 2-5 LIVING ARRANGEMENTS OF STUDENTS WITH DISABILITIES AND STUDENTS IN THE GENERAL POPULATION		
Percentage of Students with Household Characteristics	Students with Disabilities	Students in the General Population
Living with:		
Two parents	70.3 (1.1)	70.5 ^(a)
One parent	23.1 (1.1)	25.9
With relative(s)	3.8 (.7)	2.8
In foster care	1.0 (.2)	.5
Other arrangement	1.8 (.1)	.3
Head of household not a high school graduate	15.4 (.9)	8.1 ^(b) (.4)
Unemployed head of household	14.0 (.8)	10.3 ^(b) (.5)
Annual household income of:		
Less than \$25,000	35.9 (1.3)	24.4 ^(c)
\$25,000 to \$50,000	31.9 (1.2)	28.7
More than \$50,000	32.3 (1.2)	46.9
Sample size	8,083	
^(a) Figures are for 5- to 14-year-old children. Federal Interagency Forum on Child and Family Statistics (2001). ^(b) Computed using data for 6- to 12-year-olds from the National Household Education Survey (1999). Sample size = 9,584. ^(c) U.S. Bureau of the Census (2002).		

of students living in “other” arrangements was three times as high for students with disabilities as those in the general population in part because one in a thousand students with disabilities lived full time at a residential school or institution.⁶

The heads of households of students with disabilities tended to have lower levels of education than parents of the general population of same-age students. In the general population, approximately 8% of heads of households were not high school graduates, whereas almost twice as many heads of households of children with disabilities had not graduated from high school (15%, $p < .001$). Similarly, heads of households of students with disabilities were more likely to be unemployed (14%) than those in the general population (10%, $p < .001$).

Consistent with lower education levels and rates of employment, students with disabilities were more likely than others to be poor. More than a third of elementary and middle school students with disabilities were living in a household with an annual

⁶ These included residential or boarding schools, hospitals, mental health facilities, group homes, and correctional facilities.

income of less than \$25,000, compared with 24% of children in the general population ($p < .001$). Almost half again as many children in the general population lived in households with incomes of more than \$50,000 as children with disabilities (47% vs. 32%, $p < .001$).

Disability Differences in Household Risk Factors

The prevalence of risk factors among households of students with different disabilities showed quite a wide range (Exhibit 2-6). There was a cluster of students who were more likely than others to experience high levels of each kind of risk; they included students with mental retardation, emotional disturbances, traumatic brain injury, multiple disabilities, and deaf blindness. These students were the least likely to be living with two parents. Students with mental retardation, emotional disturbances, traumatic brain injuries, or multiple disabilities were the most likely to be living in foster care and to come from households with a head of household who was not employed. Students with mental retardation, emotional disturbances, or deaf blindness were the most likely to come from low-income households. Students with learning disabilities also experienced relatively high rates of some risk factors.

In contrast, students with speech or language impairments or autism had the lowest rates of some kinds of risk factors. For example, they were least likely to live in a low-income household or be in foster care and most likely to be living with two parents. In fact, they were somewhat less likely to experience each of these risk factors than students in the general population. Students with physical and sensory impairments were in the mid-range on many risk factors among the disability categories.

Summary

Students with disabilities made up 11% of all students between the ages of 6 and 13. Although they included students with 12 different primary disability classifications, three-fourths were classified as having either learning disabilities or speech/language impairments as their primary disabilities.

Although SEELS represents students who were 6 to 13 years old when data were collected, most students were in the 8- to 11-year-old age range, for the group as a whole and for each disability category. Students with speech/language impairments had a larger proportion of younger students, whereas learning disabilities and emotional disturbances were categories that had larger proportions of older students.

Two-thirds of students were boys; however, boys were approximately 56% of students with hearing impairments, mental retardation, and visual impairments, but they were 80% or more of students with emotional disturbances and autism.

African American students were somewhat overrepresented among students with disabilities relative to the general population, and Hispanic students were underrepresented among students with disabilities. The differences in the two populations of elementary- and middle-school-age students are consistent with patterns found among infants and toddlers with disabilities or developmental delays, as well as high-school-age students receiving special education. However, disproportionality concentrated among students in a limited number of disability categories.

Exhibit 2-6
HOUSEHOLD CHARACTERISTICS, BY DISABILITY CATEGORY

Percentage of Children	Learning Disability	Speech/ Language Impairment	Mental Retarda- tion	Emotional Disturb- ance	Hearing Impair- ment	Visual Impair- ment	Orthopedic Impairment	Other Health Impairment	Autism	Traumatic Brain Injury	Multiple Disabilities	Deaf- Blindness
Living with:												
Both parents	69.7 (2.0)	77.7 (2.0)	56.3 (2.4)	52.2 (2.4)	73.9 (2.5)	75.0 (2.7)	73.7 (2.4)	73.2 (2.2)	77.6 (2.2)	59.2 (5.0)	57.4 (2.7)	58.1 (18.3)
One parent	23.9 (1.9)	19.2 (1.9)	30.7 (2.3)	30.7 (2.2)	21.1 (2.3)	19.0 (2.4)	19.7 (2.2)	19.9 (2.0)	20.3 (2.2)	27.7 (4.5)	31.9 (2.5)	36.2 (17.8)
Relative(s)	3.5 (.8)	2.2 (.7)	8.2 (1.3)	8.0 (1.3)	2.9 (1.0)	2.4 (.9)	4.3 (1.1)	4.1 (1.0)	.9 (.5)	6.6 (2.5)	5.8 (1.3)	2.6 (5.9)
In foster care	1.0 (.4)	.1 (.2)	2.3 (.7)	4.6 (1.0)	.2 (.2)	1.0 (.6)	1.0 (.6)	.3 (.3)	.2 (.2)	2.1 (1.4)	1.9 (.7)	.0 (.0)
Other arrangement	1.9 (.2)	.9 (.4)	2.6 (.7)	4.4 (1.0)	1.9 (.7)	2.7 (1.0)	1.3 (.7)	2.5 (.8)	1.1 (.6)	4.5 (2.0)	3.0 (.9)	3.1 (6.3)
With head of household who was:												
Not a high school graduate	16.3 (1.6)	13.0 (1.6)	25.7 (2.1)	17.6 (1.8)	13.2 (1.9)	9.6 (1.8)	11.4 (1.7)	6.5 (1.2)	4.8 (1.1)	15.3 (3.5)	17.0 (2.1)	1.3 (3.9)
Unemployed	15.3 (1.5)	9.1 (1.4)	25.0 (2.0)	19.9 (1.9)	13.6 (1.9)	13.0 (2.0)	12.9 (1.8)	8.8 (1.4)	8.8 (1.5)	18.6 (3.8)	20.7 (2.2)	14.3 (11.8)
In households with annual income of \$25,000 or less	44.0 (2.2)	33.3 (2.3)	59.0 (2.4)	54.1 (2.4)	41.2 (2.8)	36.8 (3.0)	36.4 (2.7)	29.1 (2.3)	23.7 (2.3)	38.2 (5.0)	44.9 (2.8)	56.1 (18.0)
Sample size	847	705	724	721	858	695	825	907	1,075	307	796	40

Standard errors are in parentheses.

African Americans made up particularly large proportions of those with mental retardation, emotional disturbances, traumatic brain injuries, and multiple disabilities. The percentage of Hispanic students was particularly small among students with other health impairments and mental retardation.

The households of students with disabilities also differed significantly from the general population in the prevalence of several risk factors. Of particular note was the significantly higher rate of low-income households among students with disabilities, probably a reflection, in part, of the overall lower levels of education and employment among heads of households of students with disabilities. Several risk factors were particularly prominent among students with mental retardation, emotional disturbances, traumatic brain injuries, multiple disabilities, and deaf-blindness.

Awareness of these important differences between students with disabilities and those in the general population, and the highlighted differences between students with different primary disability classifications is an important foundation for understanding the experiences described in the remainder of this report.

3. BEHIND THE LABEL: THE FUNCTIONAL IMPLICATIONS OF DISABILITY

By Jose Blackorby, Phyllis Levine, and Mary Wagner

Since 1975, the Individuals with Disabilities Education Act (IDEA, originally referred to as the Education of All Handicapped Children Act) has provided the legislative, conceptual, and procedural framework that governs the provision of special education services to eligible students in the United States. Several major features of the federal law, including eligibility determination and reporting of data on students being served, incorporate a categorization framework that identifies the primary disability for which a student receives special education. The specific number and definitions of categories have changed, and some states have adopted alternative categorization frameworks, yet the notion of identifying and categorizing primary disabilities remains an element of the law. In fact, SEELS is designed to generate national estimates of students in each of the 12 disability categories in IDEA.

For virtually as long as the categories have existed, the field has debated their use in describing students and delivering services to them. Critics of the system cite several arguments in favor of its reform: (1) the categories are heterogeneous (Bilken, 1992; Gartner & Lipsky, 1987; Gresham, MacMillan, & Bocian, 1996); (2) assessment practices vary from place to place (Kavale, 1991; Mercer, 1992); (3) the process of labeling itself can have a negative effect on students' self-esteem (Bilken, 1992; Mercer, 1992); and (4) identification for special education can create a self-fulfilling prophecy regarding students' abilities to succeed (Lovitt, 1993). Supporters respond that: (1) a system for defining eligibility is necessary for resources to be directed to students' needs (Kauffman, 1994); (2) a primary disability designation stands for a variety of shared attributes and experiences that can be common ground on which students, parents, service providers, and advocates can gather (Kauffman, 1995); and (3) rather than permanently defining the way we think about disability, the categorization system has been flexible in responding to change as we learn more about the disabilities students experience (Kauffman & Pullen, 1996).

These debates are complicated, in part, because they involve many perspectives that have been important in the development of the special education field, including civil rights, philosophy (Christensen, 1997), values (Skrtic, Sailor, & Gee, 1996), efficacy (Cuban, 1996; Fuchs & Fuchs, 1995; Gersten, Vaughn, Deshler, & Schiller, 1997), placement (Kauffman & Lloyd, 1995), assessment methods (Mercer, 1992; Swanson, 1996), and the law (Kauffman, 1994). However, regardless of positions on the use of disability categories, there is broad agreement that what we need to know about students to serve them well goes much beyond a disability category label. Knowing only a category label, without understanding students' actual functioning in important domains, leaves us less well-informed than we need to be if we are to help students maximize their chances for success.

In this chapter, we go beyond disability category labels to take a broad look at the competencies and challenges students bring to their educational experiences. We describe several aspects of students' functioning, including:

- General health
- Movement and mobility

- Vision
- Hearing
- Communication.

For each of these, we describe parents' reports of how well students were functioning, as well as the kinds of supports they used to enhance that functioning. We conclude with a summary of functioning across these domains, recognizing that it is the combination of these factors that influences students' functioning, both in and out of school.

We examine these dimensions of student functioning for students with disabilities as a group and for students in each primary disability category. We also point out variations in functioning that relate to other important characteristics of students, including their age, gender, household income, and race/ethnicity.

Student Health

In this section, we present findings related to children's health, including childhood mortality among SEELS children, parents' reports of children's general health status, and the use of medications and medical devices to treat health problems.

Child Mortality

In this country, approximately 20 of 100,000 children between the ages of 5 and 14 die each year, with unintentional injuries being the most common cause (FIFCFS, 2001). In contrast, of

Exhibit 3-1 PRIMARY DISABILITY CLASSIFICATION OF DECEASED CHILDREN	
	Number of Children
Multiple disabilities	7
Orthopedic impairment	6
Visual impairment	3
Mental retardation	1
Emotional disturbance	1
Other health impairment	1
Traumatic brain injury	1
TOTAL	20

the 12,785 SEELS children with disabilities ages 6 to 13 for whom a parent interview or survey was attempted in 2000-2001, 20 were identified as deceased in the 12-month period ending July 2001,⁷ a mortality rate more than seven times that of children in the general population. This high mortality rate in the SEELS sample results from the disproportionate number of children in the sample with disabilities that can be associated with higher rates of child mortality. The children who had died had the primary disability classifications shown in Exhibit 3-1.

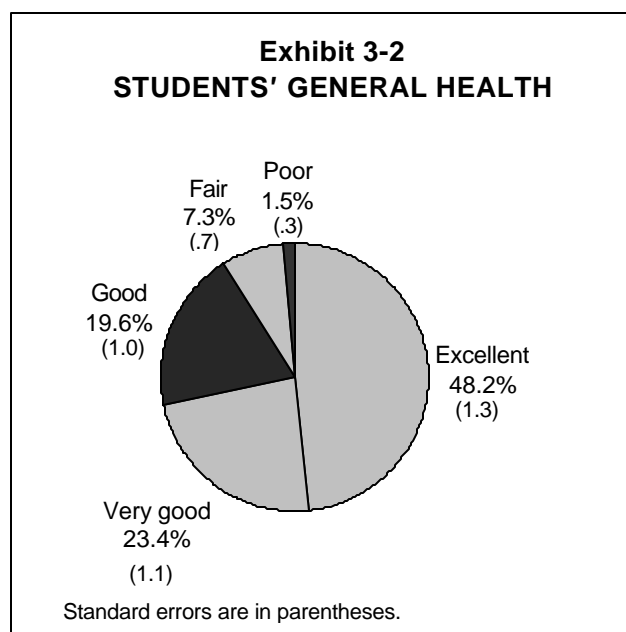
The children included equal numbers of boys and girls, even though boys were a larger portion of the SEELS sample (65%). Twenty percent of the deceased children were 7- and 8-year-olds, 35% were 9- and 10-year-olds, and 45% were 11- through 13-year-olds. The mortality rate was higher among older children than would be expected from their proportion of the SEELS sample

⁷ The mortality rate is an unweighted percentage of children in the SEELS sample, unlike other statistics reported for SEELS, which are weighted population estimates for children with disabilities nationally. The unweighted percentage is used because no parent interview or other data were collected for many of the deceased children, so they were not assigned weights for analysis purposes.

(29%). Fifteen of the deceased children were white (79%), three were African American (16%), and one was Hispanic (5%), indicating a somewhat higher mortality rate among white children than would be suggested by their proportion in the sample (65%). This contrasts with the pattern of child mortality in the general population, which is disproportionately high among African American children (29 per 100,000 vs. 15 for Asian/Pacific Islander children, for example; FIFCFS, 2001).

General Health Status

The ability of students to participate in daily activities at school and at home is conditioned in many ways by their general health. Frequent or chronic illness can cause absenteeism from school; the resulting missed exposure to the school curriculum and other learning opportunities can impede student learning and performance, sometimes significantly. Poor health also can limit activities outside of school, which can hamper development of social relationships and opportunities to hone personal interests and skills.



To assess the general health of students with disabilities, their parents were asked to rate their health as “excellent,” “very good,” “good,” “fair,” or “poor.” Almost half of students with disabilities were reported to have excellent health, and the health of almost one-fourth was reported to be “very good” (Exhibit 3-2). Almost 10% had only fair or poor health. As a group, students with disabilities were somewhat less healthy than their peers without disabilities; 82% of children in the general population who were under 18 years of age were reported to have very good or excellent health (FIFCFS, 2001), compared with 72% of students with disabilities.⁸

Disability Differences In Students' Health

There were dramatic differences in the health of students in different disability categories (Exhibit 3-3). Students with mental retardation were among the least healthy; only those with traumatic brain injuries and multiple disabilities were less likely to have excellent or very good health (56%) than students with mental retardation (57%). Their rate of having only fair or poor health (18%) was surpassed only by those with multiple disabilities (20%) or deaf-blindness

⁸ The difference between these groups was probably understated because the groups were not comparable in age; the general population of children included those ages 14 to 17, whereas the students with disabilities were no older than 13. The proportion of the population with good or excellent health declines with age (FIFCFS, 2001). Thus, if the data for the general population excluded older youth, the percentage probably would be higher.

(34%). In contrast, students with speech impairments were most likely to be healthy; 80% were reported to have excellent or very good health, a rate similar to that of the general student population.

**Exhibit 3-3
CHILDREN'S HEALTH,
BY DISABILITY CATEGORY**

	Percentage with Health Status Reported as:*		Sample Size
	Excellent or Very Good	Fair or Poor	
Learning disability	70.3 (2.1)	7.7 (1.2)	871
Speech impairment	80.0 (2.0)	6.2 (1.2)	724
Mental retardation	56.9 (2.5)	18.3 (2.0)	737
Emotional disturbance	67.6 (2.4)	8.0 (1.4)	739
Hearing impairment	69.6 (2.8)	10.2 (1.8)	874
Visual impairment	74.3 (2.9)	1-/6 (2.0)	706
Orthopedic impairment	64.7 (2.8)	15.6 (2.1)	847
Other health impairment	66.2 (2.4)	12.2 (1.6)	913
Autism	73.7 (2.4)	6.2 (1.3)	1,082
Traumatic brain injury	56.3 (5.2)	16.6 (3.9)	313
Multiple disabilities	55.9 (2.7)	20.1 (2.2)	829
Deaf-blindness	59.3 (18.9)	34.3 (18.3)	41

Standard errors are parentheses

* Percentages do not add to 100% because the category "good" health is not depicted.

**Demographic Differences in
Students' Health**

Although there were no notable differences in health status between boys and girls, and differences between age groups were not statistically significant, there were other differences in the general health between students who differed in income and racial/ethnic backgrounds (Exhibit 3-4).

The differences in general health between students from households with different levels of income were dramatic. Reported health status was consistently better at higher household income levels. For example, 34% of students in households with incomes of \$25,000 or less had excellent health, whereas half of those in households with incomes between \$25,000 and \$50,000 did ($p < .001$). Among those in households with incomes of more than \$50,000, the percentage with excellent health was almost twice that in the poorest households (64%, $p < .001$ for the difference between each successive group). The percentage of students with fair or poor health fell steadily across the income groups, from 16% for the students in the poorest households to 4% for those in the wealthiest households ($p < .001$).

Examining differences between racial/ethnic groups, white students with

disabilities were more likely to be reported as having excellent health (54%) than African American (33%) or Hispanic students (43%, $p < .001$ and $p < .05$). Excellent health was about as common for Asian/Pacific Islander and American Indian/Alaska Native students as white students, although the prevalence of fair or poor health was about twice as high among the two minority groups as among white students. The relationship of health and income noted above may help explain much of the differences in health status that we see between students of different racial/ethnic backgrounds. For example, white and Asian/Pacific Islander students were least likely to come from households with incomes of \$25,000 a year or less (Wagner, Marder, & Blackorby, 2002); they also were most

likely to have excellent health. African American students were most likely to come from the lowest-income households and also were least likely to have excellent health.

Exhibit 3-4 DEMOGRAPHIC DIFFERENCES IN STUDENTS' HEALTH			
Student Characteristics	Percentage with Health Status Reported as:*		Sample Size
	Excellent or Very Good	Fair or Poor	
Age			
6 to 9	72.7 (1.6)	8.2 (1.0)	4,468
10 to 12	70.7 (1.7)	9.4 (1.1)	3,953
13 or older	66.4 (7.2)	10.6 (4.5)	255
Household income			
\$25,000 or less	34.1 (2.1)	15.8 (1.6)	2,954
\$25,001 to \$50,000	49.5 (2.3)	5.7 (1.1)	2,452
More than \$50,000	63.5 (2.3)	3.7 (.9)	2,756
Race/Ethnicity			
White	54.1 (1.5)	5.4 (.7)	5,476
African American	33.4 (2.8)	15.6 (2.1)	1,819
Hispanic	42.7 (3.8)	13.6 (2.6)	1,064
Asian/Pacific Islander	50.3 (12.1)	10.9 (7.6)	180
American Indian/Alaska Native	51.9 (18.2)	11.5 (11.6)	45
Standard errors are in parentheses.			
* Percentages do not add to 100% because the category of "good" health is not depicted here.			

The poorer general health among low-income children also may help explain some of the disability differences noted above. Specifically, there was a higher percentage of households with incomes of \$25,000 or less among students with mental retardation than students with any other type of disability, which may explain the generally poorer health status of students with mental retardation relative to many other groups.

Use of Medications

Advances in pharmacology have generated new medications that enable many children with disabilities to cope with their medical limitations and disabilities and participate more fully at school, at home, and in the community. Yet their use is not without debate. The use of psychotropic medications to treat children with such conditions as attention deficit/hyperactivity disorder (AD/HD), depression, and anxiety is the subject of particular attention, fueled by research that shows their use is increasing (Safer, Zito, & Fine, 1996) and the age of children taking such medications is decreasing (Zito, Safer, dosReis, Gardner, Boles, & Lynch, 2000). SEELS provides the first opportunity to learn the extent to which elementary- and middle-school-age children used such drugs.

Exhibit 3-5 reveals that about one-fourth of students receiving special education in the SEELS age range were reported by parents to be taking prescription medication for conditions related to their disability. Not surprisingly, use of medications was significantly more common among children whose health was reported to be poorer. For example, only 18% of children who

were reported to be in excellent health took medications related to their disabilities, whereas 65% of those in poor health did ($p < .001$). The incidence of taking medications was particularly high among those reported by parents to have spina bifida (67%), asthma (66%), and cerebral palsy (50%).

Exhibit 3-5
STUDENTS' USE OF MEDICATION RELATED TO
DISABILITY

Use of Medications	Percentage	Standard Error	Sample Size
Percentage taking disability-related prescription medication among:			
All students with disabilities	25.5	1.1	8,684
Students whose health was:			
Excellent	18.2	1.4	3,689
Very good	26.2	2.3	2,155
Good	32.2	2.7	1,785
Fair	48.9	4.4	805
Poor	65.3	9.7	207
Percentage taking prescription medication to affect behavior, mood, or emotions	19.3	1.0	8,685
Percentage taking:			8,682
Stimulant	16.0	.9	
Antidepressant, anti-anxiety medication	5.7	.6	
Mood stabilizer	1.1	.3	
Antipsychotic medication	1.6	.3	
Seizure medication	.7	.2	
Other medication	.7	.2	

A large majority of children who used medication related to their disabilities were taking medications to affect their behavior, mood, or emotions; 19% of children were reported to be doing so, compared with 26% taking any medication at all for their disability. Taking medication to affect behavior, mood, or emotions was not related to the health of children.

Stimulants were by far the most commonly reported kind of medication taken by children with disabilities in this age group. Sixteen percent were reported to be taking stimulants; Ritalin (8%)⁹ and Adderal (5%) were the drugs taken most frequently by children with disabilities who were using stimulants. In fact, 62% of children whose parents reported that they had AD/HD were taking some kind of medication to affect behavior, mood, or emotions; 55% were taking stimulant medications. There is controversy over the use of drugs to treat AD/HD. Critics claim that drugs may be overprescribed and that they are

used with children much younger than the subjects in the clinical trials that supported the drug's FDA approval (Lyons, 1999). On the other hand, the American Academy of Pediatrics recently issued clinical practice guidelines for the treatment of AD/HD that support use of such pharmacological interventions (Subcommittee on Attention-Deficit/Hyperactivity Disorder and Committee on Quality Improvement, 2001).

Antidepressants and antianxiety medications were reported to be taken by almost 6% of children. Fewer than 2% were being given antipsychotic medications, and mood stabilizers were being taken by slightly more than 1% of children. Seizure medications and a variety of other drugs were each taken by fewer than 1% of children. Overall, about 5% of children were taking

⁹ This rate compares with an estimate of 2.8% of children ages 5 to 18 in the general population in 1995; if the documented 2.2-fold increase between 1990 and 1995 continued for the next 5 years, the estimated rate in 2001 would be approximately 7% for children in the general population (Safer, Zito, & Fine, 1996).

more than one psychotropic drug. The most common combination was a stimulant and an antidepressant or anti-anxiety medication.

About half (51%) of children who were taking psychotropic medications also were receiving psychological counseling or other mental health services, according to parents. The absence of multiple treatments for many children taking psychotropic medications could present a significant opportunity to improve treatment of AD/HD. The Multimodal Treatment Study of Children with Attention Deficit Hyperactivity Disorder (MTA Cooperative Group, 1999) found that the best treatment results were obtained with the combination of pharmacological and psychological interventions.

Disability Differences in the Use of Medication

Not surprisingly, children with different primary disabilities had strikingly different patterns of medication use (Exhibit 3-6). For example, children whose primary disability was a speech/language impairment were significantly less likely than children with any other primary disability to be using medication related to their disability; 12% were reported to be doing so. In contrast, two-thirds of children with other health impairments and about half of those with emotional disturbances, orthopedic impairments, or multiple disabilities took medications related to their disabilities. Virtually all children with emotional disturbances who were taking medication were taking psychotropic drugs. However, the rates at which students with orthopedic impairments or multiple disabilities, for example, took medications to affect their behavior, mood, or emotions were markedly lower, suggesting that many of these children were taking other kinds of medications.

Each kind of drug was being taken by some children in every category. The use of stimulants, the most frequently prescribed psychotropic drug overall, was particularly common for children with other health impairments (47%)—the category of children with AD/HD as their primary disability—and emotional disturbances (40%), but stimulants also were being taken by about one in five children with autism, multiple disabilities, orthopedic impairments, and mental retardation. Antidepressants were particularly common for children with emotional disturbances (24%) and autism (19%), as were antipsychotic drugs (11% and 9%, respectively). The rate at which children were taking more than one psychotropic medication ranged from 3% for children with learning, speech, and sensory impairments to 24% of children with emotional disturbances.

Exhibit 3-6
USE OF MEDICATION RELATED TO DISABILITY, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impairment	Mental Retardation	Emotional Disturb- ance	Hearing Impairment	Visual Impairment	Orthopedic Impairment	Other Health Impairment	Autism	Traumatic Brain Injury	Multiple Disabilities	Deaf- Blindness
Percentage taking:												
Disability-related prescription medication	22.5 (1.9)	11.9 (1.6)	34.2 (2.4)	53.8 (2.5)	21.7 (2.5)	29.8 (3.0)	48.9 (2.9)	66.9 (2.4)	43.2 (2.7)	42.3 (5.2)	49.8 (2.7)	24.3 (16.5)
Prescription medication to affect behavior, mood, or emotions	17.6 (1.7)	7.9 (1.3)	23.7 (2.1)	52.2 (2.5)	13.4 (2.1)	11.6 (2.1)	24.2 (2.5)	51.9 (2.5)	38.8 (2.6)	25.3 (4.6)	27.2 (2.4)	17.3 (14.6)
Stimulants	15.0 (1.6)	7.3 (1.3)	18.3 (2.0)	40.4 (2.5)	10.8 (1.9)	5.9 (1.6)	19.1 (2.3)	46.7 (2.5)	20.2 (2.2)	14.8 (3.7)	19.0 (2.1)	3.7 (7.3)
Antidepressants, anti- anxiety medication	3.9 (.9)	2.4 (.8)	7.1 (1.3)	24.2 (2.2)	4.4 (1.2)	4.7 (1.4)	5.5 (1.3)	13.1 (1.7)	18.6 (2.1)	11.1 (3.3)	8.1 (1.5)	6.9 (9.8)
Mood stabilizers	.8 (.4)	.2 (.2)	1.7 (.7)	6.0 (1.2)	.5 (.4)	1.0 (.7)	1.5 (.7)	2.2 (.8)	2.4 (.8)	3.0 (1.8)	1.5 (.7)	5.3 (8.6)
Antipsychotic medication	.7 (.4)	.2 (.2)	1.7 (.7)	11.2 (1.6)	.6 (.5)	2.1 (1.0)	1.5 (.7)	2.8 (.8)	9.1 (1.6)	4.4 (2.2)	5.0 (1.2)	1.4 (4.6)
Seizure medication	.4 (.3)	.2 (.2)	1.8 (.7)	2.6 (.8)	.2 (.3)	.8 (.6)	1.6 (.7)	1.6 (.6)	1.6 (.7)	3.4 (1.9)	2.5 (.9)	10.0 (11.6)
Other medication	.5 (.3)	.4 (.3)	1.4 (.6)	1.2 (.6)	.1 (.2)	.7 (.6)	.9 (.6)	1.2 (.6)	2.4 (.8)	.3 (.6)	1.5 (.7)	0.9 (3.7)
More than one psychotropic medication	3.1 (.8)	2.6 (1.3)	7.7 (1.3)	24.1 (2.2)	2.7 (1.0)	2.9 (1.1)	4.8 (1.2)	13.2 (1.8)	13.8 (1.7)	10.1 (3.2)	8.7 (1.5)	6.2 (9.3)
Sample size	880	730	736	739	874	705	851	912	1,081	310	826	41

Standard errors are in parentheses.

Demographic Differences in the Use of Medications

There were no differences between younger and older children in their use of medications related to their disabilities (Exhibit 3-7). However, the use of psychotropic medications was more common among older children; 17% of children 6 to 9 years old took such medications, compared with 22% of those 10 to 12 years old ($p<.05$) and 13 or older. Most of this difference resulted from a greater use of stimulants, which were taken by 14% of those in the youngest age group and 18% of those ages 10 to 12 ($p<.05$). This corresponds to the higher incidence of AD/HD reported by parents of older children (23% among children 6 to 8 years old, 33% of those 13 and older).

Boys with disabilities were more likely than girls to take medications related to their disability in general (28% vs. 20%; $p<.001$), psychotropic medications in particular (22% vs. 13%; $p<.001$), and multiple psychotropic medications (6% vs. less than 4%; $p<.05$). Stimulants, drugs to combat depression and anxiety, and antipsychotic medications all were significantly more commonly used by boys than girls.

Given the high cost of some pharmacological treatments, one might expect a lower incidence of use among children from lower-income households. The somewhat lower rate of health insurance coverage among poorer children would reinforce this expectation. However, no differences were noted between income groups in their use of medications in general, psychotropic medications, particular kinds of medications, or multiple medications.

No differences were noted between white and African American students in the extent to which they used medications related to their disability or used medications to affect behavior, mood, or emotions. Given that AD/HD was reported to be prevalent at virtually the same rate in the two groups, the equivalent use of medication argues against the notion of undertreatment of African American children with AD/HD suggested by other research (Safer & Malever, 2000).¹⁰

However, a consistent pattern of lower use of medications was noted among Hispanic students relative to both white and African American students. For example, psychotropic medications were being used by 8% of Hispanic students, compared with 15% of African American ($p<.05$) and 18% of white students ($p<.001$). Asian/Pacific Islander students also were less likely to be using medications. The highest rates of psychotropic drug use as a whole and use of stimulants and mood stabilizers were reported for American Indian/Alaska Native students.

¹⁰ This research was limited to one state, involved the use of Ritalin administered by school to students at school, and included elementary, middle, and high school students. Contextual factors specific to that state, a focus on medications taken under supervision at school, and/or the differences in age groups could explain the difference between the earlier findings and SEELS data for a national sample of students.

Exhibit 3-7
DEMOGRAPHIC DIFFERENCES IN STUDENTS' USE OF MEDICATION
RELATED TO DISABILITY

	Percentage Reported to Be Using:							Sample Size
	Medication Related to Disability	Medication to Affect Behavior, Mood, or Emotions	Stimulant Medication	Anti- depressant/ Antianxiety Medication	Mood Stabil- izer	Anti- psychotic Medication	More Than One Psycho- tropic Medication	
Age								
6 to 9	23.9 (1.5)	16.9 (1.4)	13.9 (1.3)	5.1 (.8)	1.1 (.4)	1.8 (.5)	5.2 (.8)	4,465
10 to 12	27.2 (1.6)	21.6 (1.5)	18.2 (1.4)	6.4 (.9)	1.1 (.4)	1.4 (.4)	5.7 (.8)	3,963
13 or older	24.7 (6.6)	21.9 (6.4)	17.8 (5.9)	5.2 (3.4)	2.7 (2.5)	1.3 (1.8)	4.6 (3.3)	254
Gender								
Boys	28.1 (1.4)	22.4 (1.3)	18.7 (1.2)	6.6 (.8)	1.3 (.4)	2.0 (.4)	6.4 (.8)	5,758
Girls	20.4 (1.8)	13.2 (1.5)	10.7 (1.4)	4.1 (.9)	.8 (.4)	.8 (.4)	3.5 (.8)	2,919
Household income								
\$25,000 or less	27.7 (2.0)	19.2 (1.7)	15.8 (1.6)	6.0 (1.0)	1.4 (.5)	1.7 (.6)	6.1 (1.0)	2,961
\$25,001 to \$50,000	23.8 (2.0)	18.8 (1.8)	15.2 (1.7)	5.9 (1.1)	1.0 (.5)	1.8 (.6)	5.3 (1.0)	2,447
More than \$50,000	23.8 (2.0)	21.0 (1.9)	18.3 (1.8)	5.6 (1.1)	.6 (.4)	1.1 (.5)	4.9 (1.0)	2,758
Race/ Ethnicity								
White	26.4 (1.4)	21.8 (1.3)	18.5 (1.2)	6.6 (.8)	1.1 (.3)	1.7 (.4)	5.9 (.7)	5,479
African American	29.8 (2.7)	18.0 (2.3)	14.7 (2.1)	5.2 (1.3)	1.2 (.6)	2.0 (.8)	5.2 (1.3)	1,817
Hispanic	16.7 (2.9)	10.5 (2.4)	7.8 (2.1)	3.3 (1.4)	.4 (.5)	.7 (.7)	3.6 (1.4)	1,066
Asian/ Pacific Islander	12.9 (7.9)	14.4 (8.3)	9.8 (7.0)	1.8 (3.2)	6.2 (5.7)	.3 (1.3)	4.7 (5.0)	181
American Indian/Alaska Native	23.8 (14.7)	40.5 (16.9)	26.5 (15.2)	.8 (3.2)	10.9 (10.7)	.4 (2.2)	11.3 (10.9)	47

Standard errors are in parentheses.

Movement and Mobility

Movement through the environment and physical motor functions are a routine part of the everyday experiences for most students at school, at home and in the community. However, students differ widely in their mobility and motor functioning. Although not all limitations in movement or mobility qualify a student for special education, when limitations in physical functioning or mobility are sufficient to require modifying a student's educational program in order for him or her to function at school, that student may be eligible for special education and/or related services. Among students receiving special education, some limitations may be accommodated by modifying teaching techniques or providing adaptive devices. Other students may require substantial mechanical assistance and related services to maintain or improve physical functioning and increase independence. Students with severe physical disabilities may not achieve the basic milestones of motor development—rolling over, holding up their heads, grasping—and may need ongoing intensive intervention and support. Students with this range of physical abilities can present a variety of challenges to students, families, and school staff.

Many students are aided in maintaining or improving movement and mobility through a variety of assistive devices. An aging “baby boomer” generation has helped spark investment in an industry that invents, creates, and markets innovative ways to improve mobility, movement, and functioning. Motivated in part by the Americans with Disabilities Act (ADA) and the active advocacy and inclusion movements, the number, range, and sophistication of assistive devices have expanded to address a wide variety of functional needs. The purposes and design of adaptive equipment range from special appliances to aid in daily living skills, computers to promote communication, and light-weight leg braces and walking canes, to breath-controlled electric wheelchairs. Adapted seating devices, prone boards, bolsters, and standing tables can help students participate and perform in the classroom. These kinds of advances, along with conscientious attention to assuring an accessible environment, can help to improve the overall quality of life for students with mobility or functional impairments at school and in their communities.

Below, we describe parents' responses to a series of questions about their children's ability to use their arms and hands for gross motor and fine motor skills and to use their legs and feet for mobility. We also report on students' use of durable medical equipment and other mobility devices to improve access to and movement in their environment, especially at school.

Using Arms, Hands, Legs, and Feet

Limitations in hand and arm functioning are reported by more than 50 million Americans, and 7.4 million Americans use assistive devices to accommodate mobility impairments (NCHS, 2001). Although many of these are the elderly, who experience the painful results of arthritis and conditions associated with aging, many children and youth also experience problems using their arms, hands, legs, and feet, with attendant challenges at school. In most schools, students spend a large portion of their day sitting at a desk or table and using educational tools that require gross motor and fine motor functioning. Social and recreational activities at school and outside of school usually require some level of mobility and motor functioning as well.

Parent responses to question regarding children's use of their arms, hands, legs, and feet assessed whether their children were able to use both appendages normally, had a little or a lot of

trouble using one or both, or had no use of one or both appendages. Parents of a large majority of students reported normal physical functioning on the part of their children with disabilities (Exhibit 3-8). From 86% to 89% of students with disabilities had normal functioning in the three areas investigated, with the lower percentage applying to use of arms and hands for fine motor skills. However, only 80% had normal functioning of both arms and hands and legs and feet; 5% had substantial trouble with one or more appendages.

Exhibit 3-8 PHYSICAL FUNCTIONING OF STUDENTS WITH DISABILITIES		
Parents' Reports of Physical Functioning	Percentage	Standard Error
Use of arms and hands for gross motor skills		
Normal	89.1	.8
A little trouble using one or both	8.4	.7
A lot of trouble using one or both	2.1	.4
No use of one or both	.5	.2
Use of arms and hands for fine motor skills		
Normal	86.1	.9
A little trouble using one or both	10.5	.8
A lot of trouble using one or both	3.0	.4
No use of one or both	.5	.2
Use of legs and feet		
Normal	88.8	.8
A little trouble with one or both	8.7	.7
A lot of trouble with one or both	2.1	.4
No use of one or both	.5	.2
Use of all appendages		
Normal use of all	79.6	1.0
A little trouble with one or more	15.3	.9
A lot of trouble with or no use of one or more appendages	5.0	.6
Sample size	8,654	

Disability Differences in Movement and Mobility

Expectations that students with orthopedic impairments would be less likely to use hands, arms, legs, and feet normally were confirmed (Exhibit 3-9), with 20% reported as having normal use of their arms, hands, legs, and feet. More than half (54%) were reported to have “a lot of trouble” or no use at all of one or more of their appendages.

However, it was not just children with orthopedic impairments who had movement and mobility limitations. Normal functioning of all appendages was reported for fewer than half of students with multiple disabilities (43%) and autism (45%) and about 55% of those with mental retardation and traumatic brain injuries. About two-thirds of students with visual and other health impairments were reported to have normal physical functioning. From 1% to 14% of students in most categories had “a lot of trouble” using or no use of one or more appendages. This level of functional limitation was

reported for almost one-fourth of students with traumatic brain injury, and almost one-third of those with multiple disabilities.

Exhibit 3-9
PHYSICAL FUNCTIONING, BY DISABILITY CATEGORY

Primary Disability Category	Percentage Reporting Use of Arms, Hands, Legs, and Feet:			Sample Size
	All Normal	A Little Trouble Using One or More	A Lot of Trouble Using or No Use of One or More	
Learning disability	85.2 (1.6)	12.6 (1.5)	2.2 (.7)	870
Speech/language impairment	87.5 (1.7)	11.0 (1.6)	1.5 (.6)	723
Mental retardation	56.8 (2.5)	30.8 (2.3)	12.3 (1.7)	737
Emotional disturbance	81.9 (1.9)	15.2 (1.8)	2.9 (.8)	738
Hearing impairment	81.3 (2.4)	14.9 (2.2)	3.9 (1.2)	874
Visual impairment	65.6 (3.2)	20.1 (2.7)	14.3 (2.3)	704
Orthopedic impairment	20.4 (2.3)	25.4 (2.5)	54.2 (2.9)	842
Other health impairment	66.9 (2.4)	21.6 (2.1)	11.5 (1.6)	911
Autism	45.4 (2.7)	41.0 (2.6)	13.6 (1.8)	1,076
Traumatic brain injury	54.1 (4.2)	22.3 (4.4)	23.6 (4.4)	311
Multiple disabilities	43.1 (2.7)	25.9 (2.4)	31.0 (2.5)	827
Deaf-blindness	34.4 (18.3)	18.9 (15.1)	46.6 (19.2)	41

Demographic Differences in Movement and Mobility

There were no differences in movement or mobility between children who differed in age or gender. However, a somewhat lower rate of normal functioning was reported for children from lower-income households. About three-fourths of those from households with incomes of \$25,000 or less were reported to have normal functioning of all appendages, compared with 82% of children from households with incomes between \$25,000 and \$50,000 ($p < .05$). Asian/Pacific Islander children were somewhat less likely to have normal physical functioning than white, African American, or Hispanic children (i.e., 66% compared with 79% to 85% of children in the other groups), and American Indian/Alaska Native students also had a lower likelihood of normal functioning (70%), although differences did not reach statistical significance because of the small size of these groups.

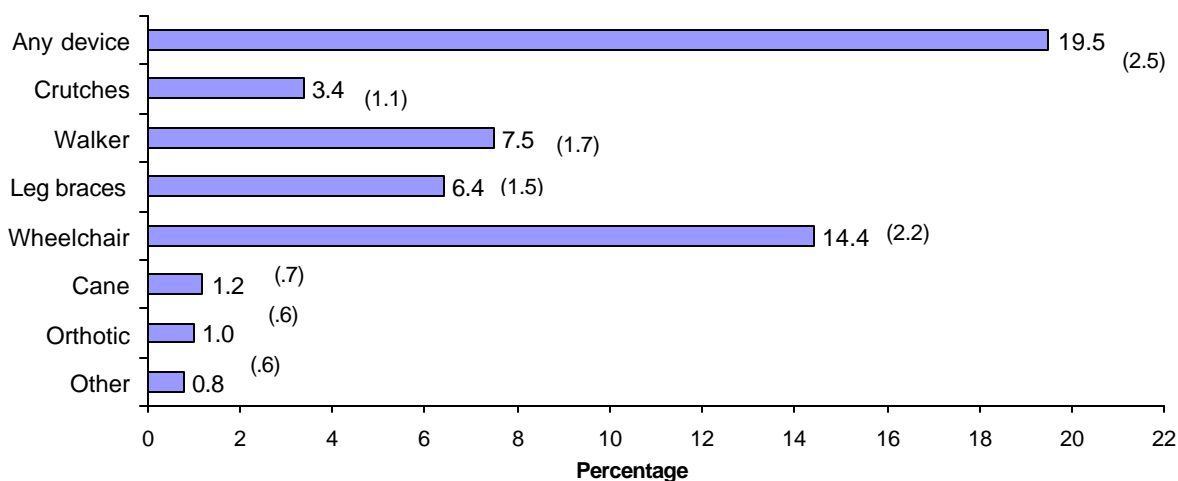
Mobility Device Use

A variety of devices are available for assisting individuals with limited movement and mobility. Mobility equipment, such as wheelchairs, walkers, crutches, canes, leg braces, orthotics,

and motorized scooters, is used to enhance the ability of students to move safely and appropriately in their school, home, and community. Some children may use different equipment at home than at school or use alternative devices at different times of the day. For example, a child may be able to manage with crutches or walking canes during part of a school day but need a wheelchair when fatigue sets in or if there is a need to move quickly.

Parents of students who were reported to have some trouble using their feet or legs were asked about the students' use of durable medical equipment and other mobility devices to improve movement. Almost one in five students who had some trouble using their legs or feet used some kind of mobility device (Exhibit 3-10), most commonly a wheelchair (14%), followed by walkers (8%) and leg braces (6%). More than three-fourths of students who used mobility devices always used them at school, and 10% frequently did so. Three percent were reported never to use their mobility devices at school.

Exhibit 3-10
USE OF MOBILITY DEVICES



Sample size = 2,334. Standard errors are in parentheses.

Parents reported that 65% of students with orthopedic impairments who reported having some trouble with legs or feet used equipment to get around (Exhibit 3-11). From 44% to 54% of students with visual impairments, traumatic brain injury, or multiple disabilities who had trouble with their legs and feet also used mobility devices, as did 29% of students with visual impairments and mobility issues. Not surprisingly, the use of mobility devices was much less common for students with learning disabilities, speech impairments, emotional disturbances, hearing impairments, and autism (ranging from 3% to 7%), even among those who had trouble using their legs and feet. More than 80% of device users with orthopedic impairments, traumatic brain injuries, and deaf-blindness always used their devices at school, as did from 66% to 73% of students in other categories.

Exhibit 3-11
USE OF MOBILITY EQUIPMENT, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impair- ments	Mental Retard- ation	Emotional Disturb- ance	Hearing Impair- ments	Visual Impair- ments	Orthopedic Impair- ments	Other Health Impair- ments	Autism	Traumatic Brain Injury	Multiple Disabil- ities	Deaf - Blindness
Uses the following mobility devices:												
Any device	4.8 (3.9)	6.6 (5.2)	18.5 (3.7)	2.6 (2.8)	6.9 (3.8)	47.6 (5.8)	64.5 (3.2)	29.1 (5.1)	4.9 (2.3)	43.6 (7.7)	47.6 (3.7)	53.9 (24.3)
Crutches	4.8 (3.9)	3.6 (3.9)	.5 (.7)	1.4 (2.0)	1.3 (1.7)	.6 (.9)	11.6 (2.2)	3.8 (2.1)	--	2.1 (2.2)	1.5 (.9)	--
Walker	2.1 (2.6)	3.0 (3.6)	6.8 (2.4)	.0	2.8 (2.5)	13.1 (3.9)	27.2 (3.0)	11.7 (3.6)	1.6 (1.3)	15.2 (5.6)	16.3 (2.8)	--
Leg braces	4.8 (3.9)	--	6.5 (2.4)	--	1.9 (2.1)	11.4 (3.7)	21.0 (2.7)	8.2 (3.1)	.7 (.9)	14.9 (5.6)	13.3 (2.5)	--
Wheelchair	2.1 (2.6)	6.6 (5.2)	13.0 (3.2)	--	3.1 (2.6)	29.6 (5.3)	50.4 (3.4)	20.6 (4.5)	3.8 (2.0)	32.3 (7.3)	36.9 (3.6)	--
Cane	2.1 (2.6)	--	--	--	.6 (1.1)	9.2 (3.4)	2.8 (1.1)	2.9 (1.9)	--	.4 (1.0)	1.1 (.8)	--
Orthotic	--	--	.9 (.9)	1.3 (1.9)	.3 (.8)	5.7 (2.7)	2.7 (1.1)	2.3 (1.7)	.5 (.7)	6.5 (3.9)	1.6 (.9)	--
Other	--	--	--	--	--	4.2 (2.3)	2.4 (1.0)	2.2 (1.6)	--	1.1 (1.6)	4.3 (1.5)	--
Frequency of use of equipment at school:												
Always	--	--	71.1 (11.1)	--	--	72.8 (7.2)	81.3 (3.4)	65.6 (11.2)	--	85.3 (9.9)	73.0 (4.6)	--
Frequently	--	--	14.6 (8.6)	--	--	19.1 (6.4)	8.3 (2.4)	11.5 (7.5)	--	10.9 (8.7)	11.6 (3.3)	--
Sometimes or never	--	--	14.3 (8.6)	--	--	8.2 (2.6)	10.4 (2.6)	22.9 (8.7)	--	3.8 (5.1)	15.4 (3.5)	--
Sample size: Children with trouble using legs and feet	55	41	202	62	109	172	608	191	285	126	458	25
Mobility device users	2	2	34	2	10	80	386	43	11	45	243	15

-- Too few cases to report separately
Standard errors are in parentheses.

There were no differences in use of mobility devices for children who differed in demographic characteristics.

Vision

The human visual system is a complex set of physical mechanisms that focus light rays on the retina and pass visual information to the brain. Vision is central to the ability to navigate through the physical environment and is important in the learning process, because much information is communicated through visual means. Vision also plays a role in interpreting more subtle aspects of communication, such as body language, that are important in social relationships.

In the context of IDEA, two disability categories specifically reference difficulties in the use of the vision system: visual impairment and deaf-blindness. However, some students in every disability category were reported by parents to have visual impairments (Wagner, 2002). The degree of impairment, including blindness, low vision, and mild visual impairment, is determined through measurements of visual acuity, visual efficiency (e.g., eye movement, discrimination, and peripheral vision), and by the functional implications of low vision for specific purposes (e.g., navigation or reading). Legal blindness is defined as 20/200 vision with correction; however, most students with visual impairments have better vision than this standard. For many students with visual impairments, orientation and mobility, and use of printed materials constitute the biggest obstacles in navigation and accessing information. In this section, we describe parents' reports of students' overall vision ability and use of glasses and devices for information access and mobility.

Most common vision problems can be straightforwardly addressed through the use of lenses to adjust light refraction to abnormalities in the shape of the eye. Parents were asked if their

**Exhibit 3-12
USE OF GLASSES OR CONTACTS
AND VISUAL ABILITY, WITH AND
WITHOUT AIDS**

	Percentage	Standard Error
Used glasses or contacts	29.1	1.2
User of glasses or contacts saw:		
Normally	80.0	1.9
With a little trouble	16.3	1.7
With a lot of trouble	3.7	.9
Nonuser of glasses or contacts saw:		
Normally	90.0	.9
With a little trouble	9.1	.9
With a lot of trouble	1.0	.3
Sample size: All students	8,678	
Glasses/contacts users	2,849	
Glasses/contacts nonusers	5,731	

child used glasses or contact lenses to correct a vision problem. Nearly 30% of students with disabilities wore glasses or contacts (Exhibit 3-12), and the vast majority (80%) of students with disabilities who used lenses could see normally with them. Interestingly, 10% of students who did not use glasses or contacts were reported to have at least some level of vision problem.

Disability Differences in Vision

Not surprisingly, the use of glasses or contact lenses was most common among students with visual impairments (67%, Exhibit 3-13). However, one-third of students in that category did not use lenses. Among students in the other disability categories, the proportion of glasses/contacts users ranged from 14% (students with autism) to 38% (students with other health impairments).

Exhibit 3-13
USE OF GLASSES OR CONTACTS AND VISUAL ABILITY, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impairment	Mental Retardation	Emotional Disturbance	Hearing Impair- ment	Visual Impair- ment	Orthopedic Impairment	Other Health Impairment	Autism	Traumatic Brain Injury	Multiple Disabilities	Deaf- Blindness
Used glasses or contacts	33.8 (2.2)	19.8 (2.0)	33.2 (2.4)	31.6 (2.3)	31.6 (2.8)	67.8 (3.1)	37.0 (2.8)	37.5 (2.4)	13.9 (1.9)	32.6 (4.9)	34.8 (2.6)	65.2 (18.4)
User of glasses or contacts saw:												
Normally	81.2 (3.1)	87.8 (3.6)	71.7 (4.0)	84.3 (3.3)	79.1 (4.6)	9.5 (2.6)	69.6 (3.7)	75.1 (3.6)	81.3 (4.6)	66.8 (8.6)	62.5 (4.4)	12.2 (18.4)
With a little trouble	16.6 (2.9)	12.2 (3.6)	17.8 (3.4)	13.1 (3.1)	18.5 (4.4)	31.3 (4.0)	25.6 (3.5)	20.1 (3.4)	17.4 (4.5)	24.1 (7.9)	23.6 (3.8)	10.1 (17.0)
With a lot of trouble	2.3 (1.2)	0.0 (.0)	10.6 (2.7)	2.6 (1.5)	2.5 (1.8)	59.2 (4.3)	4.8 (1.7)	4.8 (1.8)	1.3 (1.4)	9.1 (5.3)	13.9 (3.1)	77.7 (23.4)
Nonuser of glasses or contacts saw:												
Normally	88.9 (1.8)	93.9 (1.4)	81.6 (2.4)	88.3 (2.0)	93.7 (1.7)	3.7 (1.9)	87.5 (2.6)	91.4 (1.8)	94.3 (1.4)	80.6 (5.1)	78.7 (2.8)	25.9 (17.5)
With a little trouble	10.2 (1.7)	6.1 (1.4)	16.3 (2.3)	11.0 (1.9)	6.1 (1.7)	8.6 (2.9)	10.1 (2.4)	7.8 (1.7)	5.4 (1.4)	15.3 (4.7)	14.8 (2.5)	4.9 (8.6)
With a lot of trouble	.9 (.5)	.0 (.0)	2.1 (.9)	.7 (.5)	.2 (.3)	87.7 (3.4)	2.4 (1.2)	.9 (.6)	.4 (.4)	4.1 (2.6)	6.6 (1.7)	69.2 (18.5)
Sample size: All students	870	723	737	739	873	706	848	915	1,083	314	829	41
Glasses/contacts users	292	147	237	224	273	454	331	337	163	98	276	17
Glasses/contacts nonusers	577	575	492	510	597	231	512	571	909	207	529	21

Standard errors are in parentheses.

In disability categories that do not address vision directly, from 62% (students with multiple disabilities) to 88% (students with speech impairments) of students who used lenses had their vision corrected to normal levels with them. As one might expect, vision limitations, even with correction, were most common among students with visual impairments. Nearly 60% of those students were reported to have “a lot of trouble” seeing, even with lenses. It is important to note the much smaller but still significant numbers of students in other categories who were reported to have trouble seeing, even with corrective lenses. For example, 11% of students with mental retardation were reported to have “a lot of trouble” seeing with lenses. Further, 10% of students in each of the other disability categories were reported to have at least “a little trouble” seeing after correction. This result illustrates the continuum of visual ability among students who have recognized vision problems and corrective lenses in place. This variation in ability to see is likely to differentially affect students’ abilities to participate in education and community contexts.

Students with visual impairments who did not use lenses were even more likely to have “a lot of trouble” seeing (88%) than lens wearers. Students with deaf-blindness also mirrored this pattern to a lesser degree. Students in each of the other categories also frequently (6%-16%) were reported to have at least “a little trouble” seeing. This rate was nearly 20% among students with mental retardation and traumatic brain injuries.

Demographic Differences in Vision

Several differences in vision were apparent between students who differed in their demographic characteristics (Exhibit 3-14). Younger students were less likely than others to be wearing glasses or contacts (22% for those 6 to 9 vs. 36% of those 10 to 12; $p<.001$) and significantly more likely to see normally without them (92% of children 6 to 9 vs. 88% of those 10 to 12; $p<.05$). These differences demonstrate the developmental nature of many vision problems, which become apparent or more severe as children age. Boys were less likely than girls to wear glasses or contact lenses (27% vs. 33%; $p<.05$) and somewhat more likely to see normally without them (92% vs. 87%; $p<.05$). There were no differences between students of different ages or between boys and girls in the effectiveness of lenses to correct vision to normal for those who wore them.

There were no differences between children from poorer or wealthier households or between those of different racial/ethnic groups in their use of glasses or contacts or in their effectiveness in correcting children’s vision. However, there were significant differences in vision among children who did not wear glasses. Children from the lowest income group (\$25,000 or less) were significantly less likely to be reported as seeing normally than children from higher income groups (84% vs. 92% and 94%; $p<.001$). A significant difference also was noted in normal vision among white and African American children who did not wear glasses; 92% of white children saw normally, compared with 83% of African American children ($p<.001$). The poorer vision reported among children from low-income households and African American children could indicate unmet needs for glasses or contacts among these groups. Although they were as likely as wealthier children and those of other racial/ethnic groups to wear glasses or contacts, it is possible that their actual need for corrective lenses was greater and not fully met.

Exhibit 3-14
DEMOGRAPHIC DIFFERENCES IN USE OF GLASSES OR
CONTACTS AND IN VISUAL ABILITY

Student Characteristics	Percentage Reported to:					
	Wear Glasses/Contacts ^(a)		See Normally with Glasses/Contacts ^(b)		See Normally without Glasses/Contacts ^(c)	
	Percentage	Sample Size	Percentage	Sample Size	Percentage	Sample Size
Age						
6 to 9	21.7 (1.5)	4,462	80.2 (3.0)	1,247	92.2 (1.1)	3,149
10 to 12	36.1 (1.8)	3,959	79.4 (2.5)	1,500	87.6 (1.5)	2,432
13 or older	39.3 (7.4)	257	88.5 (8.0)	102	82.5 (7.2)	150
Gender						
Boys	27.0 (1.4)	5,761	81.3 (2.3)	1,718	91.6 (1.0)	3,985
Girls	33.2 (2.1)	2,917	77.9 (3.1)	1,131	86.6 (1.9)	1,746
Household income						
\$25,000 or less	30.5 (2.0)	2,956	77.6 (3.3)	984	83.9 (1.9)	1,938
\$25,001 to \$50,000	29.4 (2.1)	2,452	80.0 (3.3)	810	91.9 (1.5)	1,614
More than \$50,000	28.1 (2.1)	2,756	83.9 (3.2)	898	94.1 (1.3)	1,834
Race/ethnicity						
White	29.0 (1.4)	5,474	80.3 (2.2)	1,805	92.4 (1.0)	3,608
African American	30.62 (2.7)	1,824	76.7 (4.5)	604	83.1 (2.6)	1,196
Hispanic	28.7 (3.5)	1,063	82.1 (5.4)	361	86.1 (3.2)	694
Asian/Pacific Islander	14.5 (8.5)	180	82.9 (23.4)	42	95.9 (5.2)	136
American Indian/ Alaska Native	29.3 (16.6)	45	--	13	96.8 (7.4)	32

^(a) Students with reported vision problems.

^(b) Glasses/contacts users.

^(c) Glasses/contacts nonusers.

-- Too few cases to report.

Standard errors are in parentheses.

Use of Vision-Related Aids

Individuals with visual impairments long have used aids to navigate their surroundings and access printed information. Canes and guide dogs are long-standing adaptations that allow more independent navigation. Braille, the alphabetic system of raised dots, has facilitated access to text for those with visual impairments for centuries. More recently, large-print editions of books and newspapers, books on tape, optical readers, computers, and the Internet have increased the ways available for those with visual impairments to access information.

Forty-two percent of students with some degree of vision loss were reported to use such aids (Exhibit 3-15), with use being most common among those with a primary disability classification of visual impairment (90%). However, students in other categories used them as well, ranging from 29% to 77% of students with vision loss and other primary disability classifications.

Exhibit 3-15
VISUAL AID USE AMONG STUDENTS WITH REPORTED VISION PROBLEMS,
BY PRIMARY DISABILITY CATEGORY

	All Disabilities	Learning Disability	Mental Retardation	Hearing Impair- ment	Visual Impair- ment	Orthopedic Impairment	Other Health Impairment	Traumatic Brain Injury	Multiple Disabilities	Deaf - Blindness
Percentage of those with vision impair- ments reported to use:										
Any device	41.6 (5.6)	29.2 (10.5)	45.3 (10.5)	60.9 (12.7)	90.4 (2.0)	67.0 (9.9)	52.0 (12.1)	64.8 (14.5)	54.5 (7.6)	76.9 (17.1)
Braille	3.6 (2.1)	--	1.2 (2.3)	--	26.2 (2.9)	.0 (.0)	2.7 (3.9)	3.0 (5.4)	2.3 (2.3)	11.9 (13.2)
Portable Braille notetaker/writer	2.4 (1.8)	--	--	--	18.3 (2.6)	--	2.7 (3.9)	--	.9 (1.5)	10.0 (12.2)
Large print	32.1 (5.4)	26.9 (10.3)	38.9 (10.6)	60.9 (12.7)	69.8 (3.1)	48.6 (10.7)	33.1 (11.4)	28.9 (14.0)	26.6 (6.8)	64.5 (20.4)
Optical device	12.8 (3.9)	3.6 (4.4)	7.7 (5.6)	17.9 (10.2)	55.1 (3.3)	19.1 (8.3)	8.6 (7.1)	28.0 (13.9)	15.2 (5.6)	23.1 (17.1)
Mobility device	7.6 (3.0)	--	5.3 (4.7)	1.0 (2.6)	26.0 (2.9)	41.5 (10.4)	16.9 (9.1)	8.2 (8.5)	23.6 (6.5)	14.4 (14.3)
Assistive technology	17.5 (4.6)	12.1 (7.8)	10.3 (6.7)	22.2 (11.4)	50.5 (3.4)	48.4 (10.1)	12.8 (8.3)	28.2 (14.8)	30.5 (7.3)	34.6 (19.4)
Other devices	6.1 (2.7)	8.7 (6.5)	--	--	7.6 (1.8)	5.4 (4.8)	12.0 (7.9)	14.7 (10.9)	7.2 (4.0)	11.0 (12.7)
Sample size	1,097	32	43	32	677	47	40	35	122	36

There were too few students with vision loss in the categories of speech impairment, emotional disturbance, and autism to report separately.

-- Too few cases to report.

Standard errors are in parentheses.

Large print was the most commonly used adaptation (32% overall and 61% among students with visual impairments). Many students with reported vision problems also used optical readers (13% overall and 55% among students with visual impairments) or assistive technologies, such

as computers (18% overall and 51% among students with visual impairments). Braille generally, and portable Braille notetakers, were used by 26% and 18% of students with visual impairments, respectively. Mobility devices, such as canes, were used by 26% of students with visual impairments.

There were no differences in use of vision-related devices for students who differed in age, gender, household income, or race/ethnicity.

These findings illustrate that vision problems can be addressed in many ways, including the use of lenses, enlarged print, computer technologies, and other devices. To assess the value of an aid, the relative frequency that a device is used can be considered an indicator of the benefit that it confers to the user. Aids or devices that are used infrequently may not be useful, useful in specific contexts, or well matched to a student's needs. Exhibit 3-16 shows the frequency with which devices were used at school by users of portable Braille notetakers, optical devices (e.g., magnification systems), mobility devices, and assistive technologies. In each case, a majority of users used the devices "frequently" or "always," suggesting that the devices provided a benefit. Optical devices and assistive technologies were more likely to be used occasionally. This pattern illustrates the potential value of portable technologies. Optical readers and computers are more frequently limited to single locations and contexts. Portable aids/devices can be used in a range of situations and locations. Thus, although all of these devices appeared to confer benefit, these findings underscore the need to match aids to the range of contexts and applications students encounter in school and in the community.

Exhibit 3-16 FREQUENCY OF VISION AID USE AT SCHOOL BY STUDENTS WITH VISUAL IMPAIRMENTS				
	Vision Aid			
	Portable Braille	Optical Devices	Mobility Device	Assistive Technol- ogies
Percentage reporting use of aid at school:				
Always	73.8 (6.6)	33.5 (4.8)	58.7 (5.8)	35.4 (4.9)
Frequently	15.2 (5.3)	20.3 (4.1)	16.1 (4.3)	28.1 (4.6)
Sometimes	10.3 (4.5)	45.0 (5.1)	21.0 (4.8)	33.9 (4.9)
Never	.8 (1.3)	1.2 (1.1)	4.2 (2.3)	2.7 (1.7)
Sample size	126	320	184	293
Standard errors are in parentheses.				

Hearing

When we hear, we receive auditory stimuli; process them through the mechanisms of the outer, middle, and inner ear; and then send signals for interpretation to the brain. Sounds are a crucial signal to people about the conditions in their immediate environment; they can signal danger or be a source of enjoyment. Our sense of hearing also is fundamental to the ability to communicate with others through spoken language. Thus, depending on its severity, an inability to hear may have functional implications both in and out of school (Moores, 1987). IDEA recognizes the

potentially significant educational implications of hearing loss and considers it a defining feature of two disability categories: hearing impairment and deaf-blindness. However, there were students in every other disability category who were reported by parents to have some difficulty in hearing, which may have had implications for their functioning in educational and community settings.

In this section, we examine the degree to which parents reported that their children “hear normally or have a hearing problem,” and the severity of hearing loss. We then consider the extent to which students with hearing loss used hearing devices, including cochlear implants. Finally, we display parents’ reports of children’s hearing ability when using a hearing device.

Readers should keep in mind that these are parents’ reports of students’ abilities to hear. Although such reports are important and valuable, they should not be equated with the results of formal evaluations conducted by trained audiologists. It is possible, for example, that reports on hearing ability by parents of children whose primary disability is unrelated to hearing were based on parents’ perceptions, rather than the results of formal hearing evaluations. On the other hand, responses by parents whose children had diagnosed disabilities related to hearing are more likely to reflect a combination of their perception of student functioning and the results of formal evaluations. Similarly, parents may have varied in what they considered “signed communication.”

Disability Differences in Hearing Loss

To assess hearing function, SEELS parents were asked about their children’s ability to hear, compared with other students of the same age.¹¹ Almost 90% of students with disabilities were

Exhibit 3-17 STUDENTS REPORTED TO HAVE A HEARING LOSS, BY DISABILITY CATEGORY			
	Percentage	Standard Error	Sample Size
All students with disabilities	10.5	.8	8,813
Learning disability	8.3	1.3	875
Speech/ language impairment	9.3	1.5	725
Mental retardation	14.1	1.8	740
Emotional disturbance	5.8	1.2	738
Hearing impairment	100.0	.0	1,018
Visual impairment	9.2	1.9	718
Orthopedic impairment	6.9	1.5	852
Other health impairment	10.9	1.6	906
Autism	6.5	1.3	1,059
Traumatic brain injury	11.6	3.4	312
Multiple disabilities	13.8	1.9	823
Deaf-blindness	100.0	.0	47

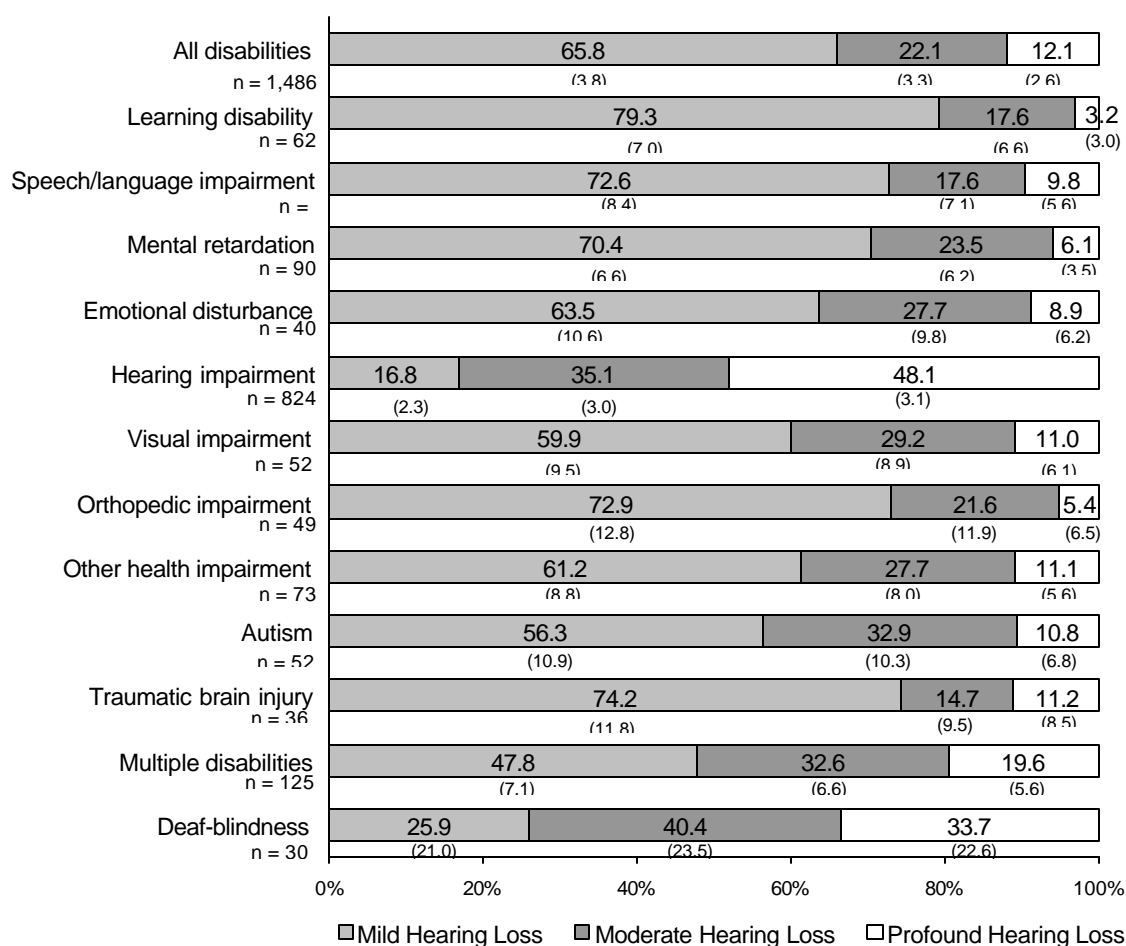
reported by their parents to hear normally (Exhibit 3-17), with almost 11% having some type of hearing loss. It is logical that reported hearing losses were concentrated among students whose primary disability classification for special education was hearing impairment or deaf-blindness.

However, students in other disability categories also were reported to have hearing losses. More than 10% of students with mental retardation, other health impairments, traumatic brain injury, or multiple disabilities were reported to have some difficulty in hearing. Although relatively few, these students represent a significant minority of students whose difficulty with hearing may have affected their ability to function in school or in the community.

¹¹ It is important to note that parents’ responses to this question may include assessments both of their children’s physical ability to perceive auditory stimuli (measured or unmeasured audiometry) and their ability to process that information effectively for educational and/or general communication purposes.

Whether students receive special education services for hearing impairments depends primarily on the degree of hearing loss. Almost two-thirds (66%) of students who were reported by parents as having a hearing loss had that loss described as mild (Exhibit 3-18). Seventy percent or more of students with a hearing loss whose primary disability classification was learning disability, speech impairment, mental retardation, orthopedic impairment, or traumatic brain injury were reported to have mild hearing losses. As would be expected, moderate or profound hearing loss was most common among students whose primary disability was hearing impairment (83%) or deaf-blindness—figures that are comparable to those in the Annual Survey of Deaf and Hard of Hearing Children and Youth (Gallaudet Research Institute, 2001). However, some students in all of the other disability categories also were reported to have profound hearing loss, affirming that students with all kinds of disabilities experienced a continuum of hearing loss.

Exhibit 3-18
SEVERITY OF HEARING LOSS, BY DISABILITY CATEGORY



Standard errors are in parentheses.

Use of Hearing Devices

Over the past 25 years, significant advances in technologies have enabled those with hearing loss to improve their ability to hear, communicate with others, and access information. For example, in- and behind-ear hearing aids better amplify sound so that some students with hearing loss hear well enough to participate in classes that rely on spoken language. Cochlear implants, which are devices inserted surgically that transmit sound to the cochlea, allow some people with hearing loss to hear sounds they otherwise could not. Environmental adaptations, such as FM loops, enable teachers to “broadcast” directly to students who wear hearing aids. Other technologies, such as closed-caption television and video, TTYs, and the Internet, have also improved access to information and entertainment and facilitated communication for deaf individuals.

Exhibit 3-19 USE AND EFFECTIVENESS OF HEARING DEVICES, BY DEGREE OF HEARING LOSS				
	Students with Hearing Loss	Degree of Hearing Loss		
		Mild	Moderate	Profound
Used a hearing device	19.0 (3.1)	5.2 (2.3)	31.6 (7.7)	70.8 (7.5)
Had a cochlear implant	1.2 (.9)	.3 (.6)	.7 (1.4)	7.4 (4.3)
Hearing capability with device reported to be:				
Normal	37.3 (5.6)	68.1 (13.7)	53.0 (9.2)	9.9 (5.4)
Had a little trouble hearing	42.2 (5.7)	29.4 (13.4)	40.1 (9.0)	50.7 (9.1)
Had a lot of trouble hearing	15.7 (4.2)	.8 (2.5)	6.6 (4.6)	29.6 (8.3)
Did not hear at all	4.8 (2.5)	1.8 (3.8)	.3 (1.1)	9.8 (5.4)
Frequency of use at school				
Always	71.1 (5.2)	61.7 (14.0)	76.2 (7.6)	73.0 (8.0)
Frequently	9.3 (3.3)	6.0 (6.8)	8.7 (5.0)	11.8 (5.8)
Sometimes	7.2 (2.9)	11.4 (9.1)	4.9 (3.8)	7.6 (4.8)
Never	12.4 (3.8)	20.9 (11.7)	10.2 (5.4)	7.5 (4.8)
Sample size: All with hearing loss	1,559	510	418	551
Device users	891	106	286	470

The SEELS data reported here focus on children’s use of devices to improve hearing (use of communication devices is discussed in the following section). Each parent who reported that his or her child had a hearing loss was asked whether a hearing device had been prescribed for the child and whether the child had a cochlear implant. Parents also were asked how well children could hear with the devices, and how frequently children actually used the devices at school.

Although the use of hearing devices was not common among students with hearing losses overall (19%, Exhibit 3-19), almost one-third of students with moderate hearing loss and 71% of those with severe hearing loss (primarily those with a primary disability classification of hearing impairment or deaf-blindness) used a hearing device. Since the approval of the Nucleus device for children in

the early 1990s, the use of cochlear implants has been increasing, although not without debate and controversy (Christiansen & Leigh, 2001). They were used by relatively few 6 to 13 year old children with parent-reported profound hearing loss (7.4%).

The rate at which students used hearing devices speaks for their utility. In most instances, however, devices did not completely compensate for hearing losses. Improvements in hearing varied considerably for students with different levels of hearing loss severity and, of course, many factors contribute to functioning with the devices across environments. Overall, more than one-third (37%) of students with hearing loss were reported to hear normally while using devices, and another 42% had only “a little trouble hearing” with the aid of a hearing device. Sixteen percent continued to have “a lot of trouble hearing,” even with a corrective device, and 7% reportedly still could not hear at all. Not surprisingly, students with mild or moderate hearing loss were significantly more likely to have normal hearing with the use of a device (68% and 53%) than students with profound hearing loss (10%; $p < .001$).

Perhaps because of their uneven effectiveness, the extent to which students actually used hearing devices in educational settings also was uneven. Although the majority of those who had hearing devices used them “always” (71%) or “frequently” (9%) at school, 20% of students used their devices only “sometimes” or “never” at school. Frequency of use did not differ for device users with different levels of hearing loss.

Demographic Differences in Hearing

There were no differences in aspects of hearing for children who differed in age or gender. Other differences, however, were apparent (Exhibit 3-20). For example, students from low-income households were more likely to be reported as having difficulty hearing than their wealthier counterparts (15% vs. 7%; $p < .01$). Students from lower-income backgrounds also were less likely to use hearing devices or have cochlear implants to improve their hearing. It is not surprising that access to devices and procedures to improved hearing was related to family income because many of these interventions are paid for with medical insurance, which was less common among lower-income families.

Student ethnicity also is an important variable that affects many aspects of functioning and educational performance. We have shown that it was correlated with family income and exhibited a similar series of relationships in the domain of hearing. African American students (14%) were more likely to have hearing problems reported than were their white peers (9%, $p < .05$). However, white students were more likely to have hearing loss described as profound by their parents (15% vs. 7%).

Exhibit 3-20
DEGREE OF HEARING LOSS, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity				
	\$25,000 or less	\$25,001 to \$50,000	More than \$50,000	White	African American	Hispanic	Asian/Pacific Islander	American Indian/Alaska Native
Percentage reporting child had a hearing loss	14.9 (1.6)	9.1 (1.3)	6.6 (1.2)	9.2 (.9)	14.0 (2.0)	11.4 (2.4)	11.4 (7.6)	16.3 (13.6)
Level of loss								
Mild	69.5 (5.6)	62.3 (7.1)	64.9 (7.9)	65.7 (4.7)	64.5 (7.9)	66.7 (11.1)	70.0 (29.4)	--
Moderate	21.4 (5.0)	26.0 (6.4)	17.8 (6.3)	19.8 (4.0)	28.1 (7.5)	25.6 (10.3)	9.3 (18.6)	--
Profound	9.1 (3.5)	11.7 (4.7)	17.3 (6.3)	14.5 (3.5)	7.3 (4.3)	7.7 (6.3)	20.7 (26.0)	--
Used a hearing device	14.0 (4.1)	18.4 (5.6)	32.3 (7.4)	23.4 (4.1)	11.5 (5.2)	17.5 (8.9)	28.0 (28.1)	--
Had a cochlear implant	.6 (.9)	.9 (1.3)	2.6 (2.5)	1.2 (1.1)	1.6 (2.0)	.8 (2.1)	.8 (5.7)	--
Sample size: All students	3,040	2,434	2,790	5,558	1,835	1,096	186	46
Students with hearing loss	598	402	411	897	322	209	36	7

-- Too few cases to report separately.
Standard errors are in parentheses.

Communication

Communication—expression and reception of information, thoughts, and ideas—can involve many mechanisms, including speech, sign language, body language, listening, and writing. It is difficult to overestimate the importance of communication for effective functioning in virtually every context. Communication is fundamental to participation in interpersonal relationships, and at school, communication among students and between students and teachers facilitates all types of learning.

Difficulties in one or more aspects of communication are a direct part of the diagnostic and eligibility criteria for students in several disability categories. Students with speech impairments most commonly have difficulty in speech production, morphology, or pragmatics. Students with hearing impairments may have particular difficulty in using spoken language. Students with autism frequently experience difficulties in understanding and applying the social conventions of communication. However, according to parents, some students in every category had some difficulty communicating in one way or another, which may have affected their ability to succeed in educational or community contexts. Thus, it is important to examine communication ability for students with all kinds of disabilities.

In addition, communication has a strong developmental component, and most students achieve fluency in a primary language by the time they enter elementary school. As communication functions develop, they become more complex, varied, and abstract, and children begin to include a larger number of communication tools. This developmental aspect of communication points up the importance of examining communication ability for children of different ages.

Finally, context is extremely important in communication, because it delineates the purpose of the communication and appropriate responses and response modes, and it influences the meaning of the communication. Differences between children in such fundamental characteristics as gender can influence the way children use language. The cultural background of children also can play an important role in how communication ability develops and is exercised; thus, we examine communication ability for children who vary in these important characteristics.

Students' Communication Abilities

Speech is a defining feature of human communication and is the most common form of communication in most community and educational settings. Effective and clear speech requires the understanding of phonology, morphology, syntax, semantics, and pragmatics. Speech also requires the physical ability to produce sounds that others can understand. However, children who have some difficulty speaking often develop skills in using alternative communication mechanisms that enable them to achieve the broader goal of expressing and receiving information, thoughts, and ideas. The interchange of information, thoughts, and ideas through conversation requires the ability to express oneself, as well as cognition, social understanding, and attention. Difficulty in any of these areas could present challenges in interpreting situations correctly, obtaining necessary information, and/or responding appropriately to others. In educational contexts, difficulty in expression can result in others' misunderstanding of requests or responses. A student's difficulty in understanding others also can lead to a failure to grasp curriculum content delivered orally, directions for carrying out learning tasks, and classroom discussions. The importance of participating in conversation increases as the demands of curriculum, instruction, and peer relationships expand as students age.

Parents were asked to report their children's ability to carry out the several skills of communication—speaking clearly, communicating effectively despite difficulty speaking, carrying on a conversation with others, and understanding what others say—compared with their perceptions of the abilities of other children of the same age. Parents reported that a majority of students with disabilities (57%) were able to speak as clearly as other students of the same age (Exhibit 3-21). Almost one in three children who were reported to have at least some difficulty speaking were said to communicate (by any means) as well as other children their age using mechanisms other than or in addition to speech. Almost two-thirds of children (65%) were reported to be able to carry on a conversation (by any means) as well as other children, and 55% of children were reported to understand what others said to them as well as other children.

Substantial numbers of students (from 35% to 45%) experienced at least some difficulty speaking, conversing, or understanding others, and almost three-fourths of those who had difficulty speaking still had some trouble communicating through other means in addition to or instead of speech. However, the parents of students who did not function as well as other children reported that most had only “a little trouble” with these communication skills. From 8% to 10% of children were reported to have “a lot of trouble” with these skills or did not perform them at all, with the exception that almost one-third of those with some difficulty speaking still had “a lot of trouble” communicating by any means or did not communicate at all.

Exhibit 3-21
STUDENTS' COMMUNICATION ABILITIES

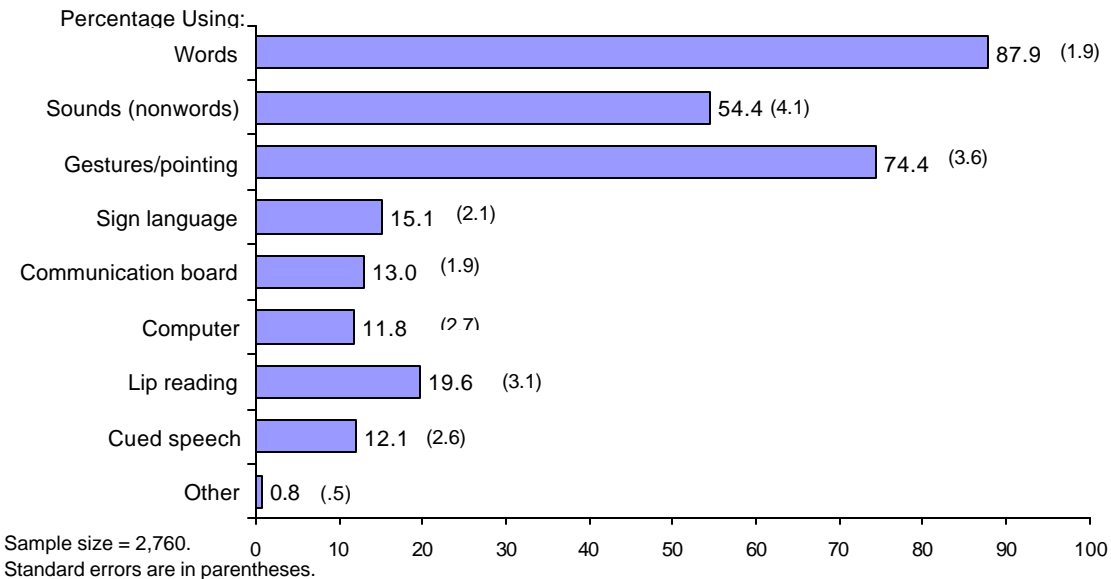
	Communication Skills			
	Speak Clearly	Communicate by Any Means ^(a)	Carry on a Spoken Conversation	Understand What Others Say
Percentage reporting child:				
Functioned as well as others his/her age	56.9 (1.3)	28.7 (2.6)	64.9 (1.2)	55.3 (1.3)
Had a little trouble with this skill	35.2 (1.2)	38.8 (2.8)	25.4 (7.3)	36.2 (1.2)
Had a lot of trouble with this skill	6.8 (.7)	29.7 (2.6)	7.3 (.7)	8.1 (.7)
Did not perform this skill at all	1.1 (.3)	2.8 (1.0)	2.5 (.4)	.6 (.2)
Sample size	8,331	2,780	8,645	8,645

^(a) Includes only those who had trouble speaking.
Standard errors are in parentheses.

Communication Mechanisms

A variety of other modes of communication were used by students who had difficulty speaking (Exhibit 3-22). Among these students, words (88%), gestures (74%), and nonword sounds (54%) were the most frequently reported communication modes. Sign and other forms of communication each were used by 11% to 20% of students who had some difficulty speaking.

Exhibit 3-22
COMMUNICATION MODE OF CHILDREN WITH DISABILITIES



Disability Differences in Communication

As one might expect, the several skills involved in communication varied dramatically by disability category (Exhibit 3-23). A consistent pattern of limited communication abilities was found for students with autism, multiple disabilities, and deaf-blindness. From one-fourth to one-third of these students were able to speak normally; fewer than 10% of those who had difficulty speaking could communicate as well as others by other means; from 10% to 30% could converse as well as other children; and similar proportions were reported to be able to understand others as well as typical children. Larger proportions had “a lot of trouble” with various aspects of communication or did not exercise particular communication skills at all. From one-third to two-thirds were reported to have substantial limitations in speech that largely were not overcome through communicating in other ways; 40% to almost 80% had substantial limitations in carrying on conversations; and one-fourth to almost half had “a lot of trouble” understanding others or reportedly did not understand others at all. Students with mental retardation also had ratings of communication skills that were at the lower end of the continuum across the various skills areas. In short, the communication limitations of students with autism and multiple disabilities were more substantial than those of students with speech/language impairments, for whom communication difficulties were the essence of their disability. The majority of students with speech or language impairments were reported to have at least some trouble producing clear speech (58%); however, 42% reportedly spoke as clearly as others, suggesting limitations in other communication skills. Despite the speech limitations of many students in this category, they were among the most likely to be rated as able to converse and to understand others (70%) as well as other children their age.

Students in most other disability categories also varied in their aptitude for the various communication skills. For example, students with learning disabilities (72%), emotional disturbances (73%), and visual impairments (75%) were most likely to speak as clearly as others of the same age. However, none of these categories of students was uniformly among the most capable in other skill areas, and the areas in which they had limitations differed. For example, in addition to a high likelihood of normal speech, students with learning disabilities were among the most likely to communicate as well as others, despite difficulties with speech, and to converse as well as others. However, they did not excel in understanding what others said to them (54% reportedly understood others as well as typical children), perhaps reflecting the difficulty some students with learning disabilities had with tasks such as understanding and following directions.

In contrast, students with visual impairments, who were highly likely to speak as well as others, also were among the most likely to converse with and understand others as well as other students their age; however, those with visual impairments who also had speech limitations were among the least likely to overcome them and communicate effectively by other means. These different patterns of skills across disability categories testify to the complex combination of abilities required for effective communication.

Exhibit 3-23
COMMUNICATION ABILITY, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impairment	Mental Retardation	Emotional Disturb- ance	Hearing Impairment	Visual Impairment	Orthopedic Impairment	Other Health Impairment	Autism	Traumatic Brain Injury	Multiple Disabilities	Deaf- Blindness
Student spoke:												
As well as others	72.4 (2.1)	41.8 (2.5)	41.5 (2.5)	73.0 (2.3)	35.4 (3.1)	74.9 (2.9)	59.0 (2.8)	64.4 (2.4)	34.3 (2.3)	51.4 (5.3)	30.5 (2.6)	24.6 (20.4)
With a little trouble	24.4 (2.0)	51.7 (2.5)	35.0 (2.4)	23.1 (2.1)	45.4 (3.3)	15.5 (2.5)	27.0 (2.6)	29.6 (2.3)	33.8 (2.6)	34.7 (5.0)	36.8 (2.7)	11.6 (15.2)
With a lot of trouble or not at all	3.2 (.8)	6.6 (1.3)	23.5 (2.2)	4.0 (1.0)	19.2 (2.6)	9.6 (1.9)	14.0 (2.0)	6.0 (1.3)	42.9 (2.9)	13.9 (3.3)	32.8 (2.6)	63.8 (22.8)
Student communicated by any means:												
As well as others	48.3 (7.3)	28.6 (6.4)	12.5 (3.0)	32.5 (8.1)	39.7 (3.0)	20.4 (5.3)	18.3 (5.5)	25.1 (5.9)	2.9 (1.2)	18.5 (7.8)	7.5 (2.0)	4.6 (9.4)
With a little trouble	31.1 (6.8)	49.7 (7.1)	36.9 (4.3)	40.3 (8.4)	46.6 (3.1)	23.1 (5.5)	29.8 (6.6)	50.0 (6.8)	22.0 (3.0)	33.2 (9.4)	27.6 (3.4)	32.1 (20.8)
With a lot of trouble or not at all	20.6 (5.9)	21.7 (5.9)	50.7 (5.0)	27.2 (7.3)	13.7 (2.2)	50.5 (7.1)	51.9 (7.4)	24.9 (5.8)	75.4 (3.5)	48.4 (10.2)	65.0 (3.6)	63.3 (22.8)
Student conversed:												
As well as others	72.3 (2.1)	70.1 (2.3)	36.0 (2.4)	65.4 (2.4)	41.3 (3.0)	70.6 (3.0)	62.4 (2.8)	61.8 (2.5)	10.4 (1.6)	42.3 (5.2)	29.4 (2.5)	12.8 (12.9)
With a little trouble	23.0 (1.9)	24.0 (2.1)	37.1 (2.4)	26.4 (2.2)	40.3 (3.0)	15.1 (2.4)	22.8 (2.4)	27.7 (2.3)	25.4 (2.3)	38.7 (5.1)	30.0 (2.5)	8.5 (10.7)
With a lot of trouble or not at all	4.6 (1.0)	5.0 (1.2)	27.0 (2.2)	8.2 (1.5)	18.5 (2.4)	14.3 (2.3)	14.8 (1.9)	10.5 (1.5)	64.2 (2.5)	19.0 (3.8)	40.5 (3.2)	78.8 (17.3)
Student understood others:												
As well as others	53.7 (2.3)	70.1 (2.3)	28.7 (2.3)	53.7 (2.5)	26.8 (2.7)	70.9 (3.0)	63.6 (2.8)	49.3 (2.5)	15.3 (1.9)	34.7 (5.0)	29.4 (2.5)	10.7 (12.4)
With a little trouble	38.7 (2.2)	25.1 (2.2)	52.9 (2.5)	37.8 (2.4)	58.4 (3.0)	22.1 (2.8)	30.6 (2.7)	42.6 (2.5)	51.3 (2.7)	49.4 (5.3)	46.1 (2.7)	42.7 (19.8)
With a lot of trouble or not at all	7.7 (1.3)	4.8 (1.1)	18.4 (2.1)	8.4 (1.5)	14.8 (2.2)	7.0 (1.7)	5.8 (1.4)	8.0 (1.4)	33.4 (2.6)	15.9 (3.9)	24.5 (2.3)	46.6 (20.1)
Sample size: All students	869	723	738	738	869	704	844	910	1,077	311	822	40
Students with speech difficulty	86	91	235	64	846	121	159	128	504	77	435	34

Standard errors are in parentheses.

Demographic Differences in Communication

Several characteristics of students besides their disabilities were associated with differences in communication (Exhibit 3-24). Although there were no differences between boys and girls, the age of students was associated with differences in some communication characteristics. Age plays a part in many educational processes, but it is particularly dramatic in the developmental process of speech acquisition. Because speech skills improve with age for most children, it is not surprising that speech impairments are among the most common disability categories among younger children, but there are very few such students in secondary school (OSEP, 2001). Consistent with this trend, students 13 years old or older (73%) were significantly more likely to be reported to speak as clearly as other children than their counterparts who were 6 to 9 years old (48%; $p < .001$). Also, among those who had difficulty with speech, older students showed a small but consistently greater likelihood of relying on words and a corresponding lower likelihood of using communication modes other than speech, such as nonword sounds (58% among students 13 and older vs. 33% among those ages 6 to 9); lip reading (20% vs. 7%); and cued speech (15% vs. 3%). In contrast, students' age did not appear to relate to their ability to communicate by any means or to participate in conversation. However, compared to 6 to 9 year olds older students appeared to have greater difficulty understanding other people (59% vs. 43%). This difference may reflect the larger proportion of students with autism and emotional disturbances among older cohorts, disabilities associated with relatively lower ratings on these communication abilities.

Students from different economic backgrounds showed different patterns related to speech and communication. Students from the lowest income group were significantly less likely to be reported as speaking as clearly as other children (53%) than children from higher-income households (60% for those with incomes of \$25,001 to \$50,000; $p < .05$). Students from lower-income groups also were significantly less likely to converse with others normally (58%), compared with students from higher-income families (68% and 69%; $p < .01$ and $p < .001$). A similar pattern held for understanding others in conversations (48% vs. 56% and 64%; $p < .01$ and $p < .001$).

Regarding differences between students in different racial/ethnic groups, Asian students were somewhat less likely than students in other groups to speak as clearly and converse as well as age peers, significantly so in the case of conversing (41% vs. 67% for white children; $p < .05$). African American students were somewhat less likely than other students to have parents report that they understood what others said to them as well as other children (45% vs. 58% for white children; $p < .001$).

Exhibit 3-24
DEMOGRAPHIC DIFFERENCES IN COMMUNICATION ABILITY

Student Characteristics	Compared with Others the Same Age, Percentage Reported to:							
	Speak as Clearly ^(a)		Communicate as Well by Any Means ^(b)		Converse as Well ^(a)		Understand Others as Well ^(a)	
	Percentage	Sample Size	Percentage	Sample Size	Percentage	Sample Size	Percentage	Sample Size
Age								
6 to 9	48.2 (1.8)	4,285	25.1 (3.4)	1,556	63.7 (1.7)	4,451	58.5 (1.7)	4,448
10 to 12	64.9 (1.8)	3,801	34.3 (4.2)	1,148	66.0 (1.8)	3,950	52.8 (1.9)	3,944
13 or older	73.1 (6.7)	245	11.0 (12.5)	76	65.7 (7.2)	253	42.5 (7.5)	253
Household income								
\$25,000 or less	53.3 (2.2)	2,802	29.1 (4.2)	1,009	58.0 (2.2)	2,945	47.8 (2.2)	2,948
\$25,001 to \$50,000	60.3 (2.3)	2,369	30.3 (4.8)	754	67.6 (2.2)	2,445	56.1 (2.3)	2,445
More than \$50,000	57.3 (2.3)	2,674	27.3 (4.9)	856	69.1 (2.2)	2,754	63.7 (2.3)	2,743
Race/ethnicity								
White	57.4 (1.5)	5,291	27.4 (3.2)	1,687	66.6 (1.5)	5,459	58.3 (1.5)	5,401
African American	55.3 (3.0)	1,747	28.1 (5.5)	568	60.1 (2.9)	1,818	45.3 (2.9)	1,820
Hispanic	58.1 (3.8)	997	28.5 (7.8)	388	64.9 (3.7)	1,063	55.5 (3.8)	1,060
Asian/Pacific Islander	39.6 (12.4)	165	27.3 (18.2)	90	40.8 (12.0)	177	55.5 (12.1)	178
American Indian/ Alaska Native	76.0 (15.6)	44	70.0 (37.5)	15	80.3 (14.5)	45	55.7 (18.2)	3,149

^(a) Students with reported problems speaking.

^(b) Students with speech problems.

Standard errors are in parentheses.

Communication Methods

The use of communication method was strongly related to, but not determined by, students' primary disability (Exhibit 3-25). For example, students with hearing impairments who also had trouble with speech were more likely than students in other disability categories who had speech difficulties to use sign (44%), lip reading (66%), sounds other than words (99%), and gestures (97%). In contrast, students with autism (36%) and orthopedic impairments (34%) who had speech limitations were most likely to use communication boards. Those with autism or hearing impairments also were most likely to use cued speech (27% and 25%). Students with traumatic brain injury were most likely to report the use of computers to communicate (30%).

Exhibit 3-25
COMMUNICATION MODE, BY DISABILITY CATEGORY

Communication Mode	Learning Disability	Speech/ Language Impair- ment	Mental Retard- ation	Emotional Disturb- ance	Hearing Impair- ment	Visual Impair- ment	Orthopedic Impair- ment	Other Health Impair- ment	Autism	Traumatic Brain Injury	Multiple Disabilities	Deaf- Blindness
Percentage of students with communication limitations who used:												
Words	92.7 (3.8)	95.2 (3.1)	85.4 (3.2)	94.1 (4.1)	85.7 (2.1)	56.2 (6.6)	67.0 (6.8)	88.8 (4.3)	74.4 (3.1)	74.7 (8.8)	60.0 (3.8)	73.1 (20.3)
Sounds (nonwords)	46.4 (14.3)	46.0 (11.4)	57.2 (5.7)	25.4 (12.2)	98.7 (2.2)	73.0 (8.2)	72.1 (7.3)	50.9 (10.9)	62.7 (3.7)	60.4 (14.6)	71.7 (4.0)	22.9 (46.5)
Gestures/pointing	77.1 (12.0)	69.2 (10.2)	76.8 (4.9)	57.5 (14.2)	96.7 (5.6)	53.1 (9.1)	76.3 (6.9)	69.4 (10.0)	86.2 (2.7)	72.1 (13.4)	72.4 (3.9)	9.6 (29.3)
Sign	7.1 (3.8)	8.2 (3.9)	20.6 (3.7)	5.5 (4.0)	44.5 (3.0)	12.0 (4.3)	28.0 (6.4)	9.7 (4.0)	24.4 (3.1)	8.5 (5.7)	29.0 (3.5)	40.8 (22.4)
Communication board	11.2 (4.6)	7.7 (3.8)	14.5 (3.2)	3.3 (3.1)	10.2 (1.9)	15.2 (4.8)	33.9 (6.8)	8.1 (3.7)	36.3 (3.5)	29.8 (9.3)	26.6 (3.4)	23.4 (19.6)
Computer	.0 (.0)	13.9 (7.9)	11.1 (3.6)	3.4 (5.2)	12.8 (35.3)	11.0 (5.8)	33.0 (7.7)	7.3 (5.8)	22.6 (3.3)	31.5 (13.8)	16.2 (3.3)	.0 (.0)
Lip reading	10.8 (5.4)	16.0 (6.7)	12.0 (4.7)	10.6 (6.9)	65.8 (2.9)	9.9 (5.7)	11.8 (8.7)	13.8 (5.9)	15.5 (6.6)	23.6 (11.5)	20.5 (5.7)	12.0 (16.4)
Cued speech	7.0 (4.4)	9.5 (5.3)	15.7 (5.3)	5.3 (5.0)	24.6 (2.7)	6.1 (4.5)	21.3 (10.9)	13.2 (5.8)	27.6 (8.1)	10.8 (8.4)	24.0 (6.2)	7.3 (12.9)
Other	.0 (.0)	.0 (.0)	.3 (.5)	.0 (.0)	1.6 (.8)	10.3 (4.0)	6.7 (3.6)	1.2 (1.5)	3.3 (1.3)	3.1 (3.6)	3.5 (1.4)	3.0 (7.8)
Sample size	86	91	231	61	850	118	157	128	506	75	426	31

Standard errors are in parentheses.

The exhibit illustrates the diversity of modes of communication for all students with disabilities. In fact, some students in each of the disability categories were reported to be using each of the communication modes. Further, many students appeared to rely on a combination of methods to communicate.

Use of Sign by Students with Hearing Loss

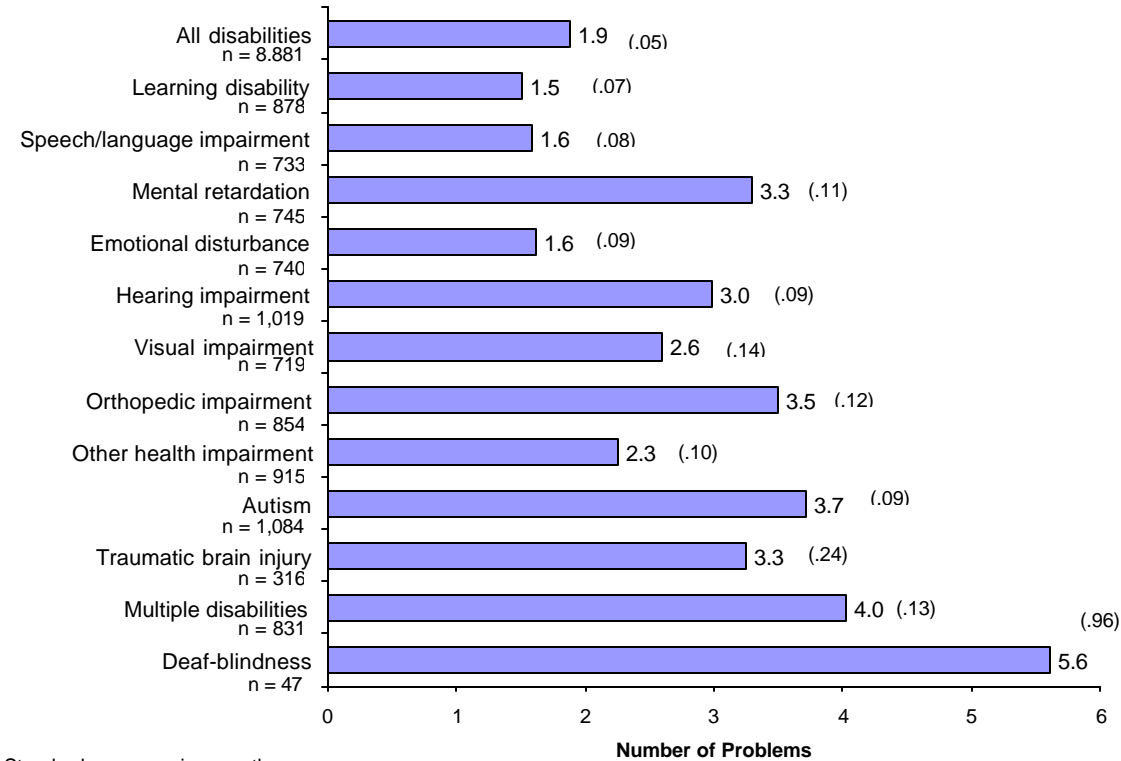
Signed communication and sign languages involve the placement, position, and motion of hands and fingers to form sentences and/or communicate ideas. They serve the same communication function as speech, except that they use visual-motor processing in the brain, as opposed to the auditory-vocal channel used in speech. American Sign Language (ASL) is recognized as a language, with a structure and grammar that allows for concrete, subtle, and abstract communication. It is a dominant form of communication in the culturally deaf community and in many schools and universities for deaf students. Signed English is a manual version of English that follows its word order and structure. It is used in many programs in the public elementary and secondary school system.

Although students with hearing impairments were the most common users of sign, students with hearing loss who had other primary disability classifications also were reported to use sign.

Functioning Across Domains

Problems in each of the physical/health, sensory, and communication domains reported thus far can have important implications both for students' efforts to learn and for the educational systems' efforts to provide curricula, instruction, and accommodations that address students' needs. Problems in these areas often do not occur in isolation. They can co-occur with one another and combine with many other strengths and challenges in defining what students bring to their educational experiences. Exhibit 3-26 depicts the average number of physical, health, sensory, and communication domains in which parents reported their children had at least some difficulty. As a whole, students with disabilities were reported to have difficulties in two of the seven domains, with dramatic variations by disability category. Students with deaf-blindness, multiple disabilities (4.0), and autism (3.7) were reported to have difficulties in the greatest number of domains. Students with learning disabilities, speech impairments, and emotional disturbances reported an average of 1.5 problems in these domains. Students in other categories were reported to have between 2 and 3.5 problems in these domains. These findings illustrate both that very few students with disabilities presented problems in a single domain and that the number of affected domains varied widely.

Exhibit 3-26
AVERAGE NUMBER OF PROBLEMS IN THE PHYSICAL, SENSORY,
AND COMMUNICATION DOMAINS, BY DISABILITY CATEGORY



Summary and Conclusions

This chapter confirms that a student's designated disability category explains only a portion of the intricate puzzle of student functioning. Health, vision, hearing, and communication all contribute in independent and related ways to influence students' abilities to learn, interact with others, and participate successfully in the educational process.

Good health is taken for granted by most of us in the course of daily life. However, when health is failing, it can negatively affect all areas of an individual's life at school, at home, and in the community. Although most students with disabilities were healthy, as a group, they were less healthy than their peers in the general population. Further, one in four students with disabilities were taking medication for conditions related to their disabilities. Most of the drugs prescribed were to affect behavior, mood, or emotions. Although the rate of using such medications was higher among students with emotional disturbances, some students in all disability categories were using them. Given the current policy interest regarding the use of medications in schools, it will be especially important to examine how students using medications compared with peers with similar disabilities who were not.

The number of students reported to have limitations of various kinds ranged considerably across the functional domains. Relatively few (less than 15%) of students with disabilities were reported to have difficulties in mobility, vision, or hearing. However, problems in various aspects of communication were more common; nearly 40% of students were reported to have problems in one or more of the areas related to conversing, speaking, or understanding others. For the most part, difficulties in these domains aligned with the diagnostic criteria associated with specific disability categories. Students with hearing impairments, visual impairments, and speech impairments were more likely to have limitations in those areas than other students. However, it is important to emphasize that substantial numbers of students in virtually every disability category had difficulties in those domains. Some of this phenomenon may be related to the severity of identified problems. For example, some students with reported hearing difficulties may not have had a problem that was severe enough to garner attention or require intervention. Nonetheless, it may have been an obstacle to participation in learning and social activities.

The difficulties in the communication domain that were addressed in this chapter are of particular importance because of the central role communication plays in many facets of learning and participating in a school community. It would be logical to assume that such problems would be associated with difficulty in hearing and producing speech, and they were. However, significant limitations in communication were not most common among students identified with speech and hearing impairments. Rather, significant communication problems were greatest among students with autism or emotional disturbance, who experienced difficulties in the cognitive and social processes of communicating.

Problems in mobility, vision, hearing, and communication each had different and unique implications for students' abilities to function effectively in schools. Hearing presented problems in communication; vision presented problems with mobility; etc. In each case, students who were reported to have a problem in a domain used a wide variety of tools, strategies, and devices to compensate for or ameliorate the limitation. For example, students reported to have hearing loss used sign language, hearing aids, and gestures to help them communicate. Students with vision problems used glasses/contact lenses, white canes, Braille, and optical readers. Wheelchairs, crutches, and canes were used by students with physical problems. Indeed, many students were reported by parents to be able to function "normally" with the use of such strategies and devices. This is an important reminder that, with proper supports, a disability does not necessarily limit students in their functioning.

We have shown that poverty was prevalent among students with disabilities and had negative impacts on students' functioning in a number of domains, as well as on access to devices and aids that could improve functioning. Students from low-income families were more likely to report poor health, as well as vision and hearing problems. Their higher likelihood of being without health insurance may help explain the greater likelihood of having uncorrected vision and hearing problems. This finding further illustrates the persistent challenge that poverty presents to students, families, and educators.

In the end, it is the combination of physical, sensory, and communication abilities and their relationships with each other and with other characteristics of students and their lives that will shape the challenges and opportunities encountered by individual students. It was common for students to have difficulties in more than one of the domains addressed in this chapter, with

many combinations of limitations for students with each primary disability classification. Forthcoming SEELS analyses will shed further light on these wide-ranging disability profiles and their relationships to services provided and the academic and social results students achieve.

4. GETTING AROUND, GETTING ALONG: THE DAILY LIVING AND SOCIAL SKILLS OF STUDENTS WITH DISABILITIES

**By Tom W. Cadwallader, Renée Cameto, Jose Blackorby,
Peggy Giacalone, and Mary Wagner**

The preceding chapter described the manifestations of disability in terms of students' health and functioning in the physical, sensory, and communication domains. Here, we consider the implications of disability for students' capacities to carry out activities of daily living and to interact with others in family and social relationships. We also expand our understanding of what students can do through a discussion of parents' reports of the strengths of their children.

Findings are presented for students with disabilities as a whole and for those who differ in primary disability classification, age, gender, household income, and race/ethnicity.

Daily Living Skills

As children age, their competence to care for their personal needs generally grows, and their independence grows with it. Cognitive ability also increases for most children, as they become increasingly able to engage higher-order-thinking challenges. Increased responsibility for household tasks also often goes along with increasing age. However, some disabilities can delay or circumvent the usual development of children's competencies and/or independence in different ways and to varying degrees. Limitations in the ability to carry out tasks of daily living can place stress and burden on caregivers at home and can require school staff to fill nontraditional roles in caring for non-educational needs of students, as well as any learning challenges they may experience. In this section, we explore parents' reports of the competencies of children with disabilities to care for fundamental self-care needs, to carry out common cognitive tasks, and to take on responsibilities for household activities. We also relate skills and responsibilities in these areas to parents' expectations for their children's future independence.

Self-Care Skills

To assess the abilities of students with disabilities to care for their basic needs, their parents were asked to rate how well students were able to feed and dress themselves without help. Abilities were measured on a 4-point scale: "very well," "pretty well," "not very well," "not at all well." A large majority of students with disabilities were reported to be able to feed and dress themselves independently (Exhibit 4-1). Almost 90% of students were rated by parents as being able to feed themselves on their own "very well" and 8% "pretty well." Parents reported that almost 80% of students could dress themselves independently "very well" and more than 15% could dress themselves "pretty well." A small number of students had trouble dressing or feeding themselves (6% and 2%, respectively).

To obtain a broader picture of students' abilities to handle these fundamental activities of daily living, we created a summative scale of parents' ratings of students' abilities to dress and feed themselves, which ranged from 2 (both skills done "not at all well") to 8 (both skills done "very well"). More than three-fourths of students with disabilities scored 8 on this scale, whereas only 2% performed at the low range (2 to 4), demonstrating difficulty with both dressing and feeding tasks.

Exhibit 4-1
SELF-CARE SKILLS OF STUDENTS
WITH DISABILITIES

	Percentage	Standard Error
Fed themselves without help		
Very well	89.5	.8
Pretty well	8.3	.7
Not very well or not at all well	2.2	.3
Dressed themselves without help		
Very well	78.6	1.0
Pretty well	15.6	.9
Not very well or not at all well	5.8	.3
Self-care scale score		
High (8)	76.6	1.0
Medium (5 to 7)	21.4	1.0
Low (2 to 4)	2.0	.3
Sample size: All students	9,216	

Functional Mental Skills

Parents also were asked to evaluate their children regarding four skills that often are used in daily activities—telling time on a clock with hands, reading and understanding common signs, counting change, and looking up telephone numbers and using the telephone. Parents reported how well their children performed these activities without help on a 4-point scale: “very well,” “pretty well,” “not very well,” “not at all well.” The age at which children typically accomplish these skills is variable and depends on a variety of factors, including exposure to the task (e.g., children in homes without telephones

may not observe others looking up telephone numbers or using the telephone). Given the appropriate instruction, children generally are able to master these tasks early in elementary school.

We refer to these skills as functional mental skills because they require the mental ability to read, count, and calculate. As such, they suggest much about students’ abilities to perform a variety of more complex cognitive tasks at school. However, they also require sensory and physical skills to see signs, manipulate a telephone, etc. A high score indicates high functioning in all of these areas; a low score may indicate deficits in one or more of the cognitive, sensory, or physical domains.

Parents reported that their children had much greater difficulty performing these functional mental skills than the self-care skills described previously (Exhibit 4-2). Reading and understanding common signs was done “very well” or “pretty well” by almost 90% of students, whereas about 70% of students could tell time or count change at these levels of skill. Looking up telephone numbers was the most difficult, with 55% performing this “very well” or “pretty well.”

We created a summative scale of parents’ ratings of students’ abilities to perform these functional mental skills, which ranged from 4 (all skills done “not at all well”) to 16 (all skills done “very well”). About one-fourth of students with disabilities scored “high” on this scale (15 or 16), whereas 12% scored at the low range (4 to 8), indicating they had difficulty with several of the tasks involved. Performance of the kinds of tasks encompassed by this scale relate significantly to students’ performance in school. For example, students with high functional mental skills were significantly less likely than low-skilled students to have been retained at grade level at some time in their school careers (17% vs. 37%; $p < .001$). They also were significantly more likely than low-skilled students to have parents describe their school work as “excellent” (25% vs. 4%; $p < .001$).

Exhibit 4-2
FUNCTIONAL MENTAL SKILLS OF
STUDENTS WITH DISABILITIES

	Percentage	Standard Error
Read common signs		
Very well	70.0	1.1
Pretty well	18.3	.9
Not very well	7.8	.7
Not at all well	3.9	.5
Told time on an analog clock		
Very well	37.2	1.2
Pretty well	32.1	1.1
Not very well	20.1	1.0
Not at all well	10.7	.7
Counted change		
Very well	41.9	1.2
Pretty well	28.4	1.1
Not very well	21.9	1.0
Not at all well	7.8	.7
Looked up telephone numbers and used the phone		
Very well	30.7	1.1
Pretty well	24.1	1.1
Not very well	23.3	1.0
Not at all well	21.9	1.0
Functional mental skills scale score		
High (15 or 16)	24.7	1.0
Medium (9 to 14)	62.9	1.2
Low (4 to 8)	12.4	.8
Sample size	9,216	
Students age 12 or older	2,360	

Household Responsibilities

Household chores are a fact of life for most children. More than 96% of elementary-school-age children in the general population were reported by parents to be involved in household chores in some way (NCES, 2000), and 90% of parents of students with disabilities in elementary and middle school said they had rules at home about students' doing household chores.

Responsibilities around the house often are expected of children as they age, and can include such activities as fixing their own breakfast or lunch, cleaning up their room or living area, and doing laundry. As children mature, they also learn to function more independently outside the home, becoming able to get to places within their neighborhood on their own and being responsible for activities like buying a few things they might need at a store. Thus, these kinds of daily living skills measure both students' competence and their independence. However, they also reflect factors external to children themselves: family culture, parents' expectations, and levels of independence that parents believe are appropriate and safe for children of particular ages.

Parents were asked how often students fixed their own breakfast or lunch, cleaned up their personal items, and did laundry; parents of children who were at least 12 years old also were asked how often children bought a few things at a store when they were needed. Parents reported the frequency of performing these skills on a 4-point scale: "always," "usually," "sometimes," and "never." Parents of children who were 12 years old or older also were asked to describe how well students could get around outside the home independently as "very well," "pretty well," "not very well," or "not at all well."

No more than 40% of students were reported to perform any of the household responsibilities we investigated "always" or "usually" (Exhibit 4-3). When doing these household chores "sometimes" was considered, the percentages of children engaged in these activities at some level increased

substantially. Straightening up one's room was done most frequently, with 40% doing it "always" or

"usually" and 45% doing it "sometimes." Thirty-five percent of children "always" or "usually"

made their breakfast or lunch, and 48% did so "sometimes." In contrast, only about one-fourth of students (28%) ever did laundry.

Among students 12 or older, more than three-fourths were involved in buying a few items at a store at least occasionally, with about 30% doing so "always" or "usually." On average, about 80% of students were rated by parents as being able to get to places in their neighborhood "very well" or "pretty well."

To provide an overview of students' household responsibilities, we created a summative scale of parent ratings of the frequency with which students did laundry, straightened up their rooms, and fixed their own breakfast or lunch.¹² The scale ranged from 3 (all activities "never" done) to 12 (all activities done "always"). More than 60% of students scored "low" on this scale, indicating that they did these activities "sometimes" or "never." Only 2% were reported to do almost all the activities "always."

Daily Living Skills and Expectations for Future Independence

We were interested in exploring the extent to which the level of students' daily living skills and

responsibilities in elementary and middle school were related to or helping to shape parents' expectations of how independent students were likely to be in the future. To assess expectations

Exhibit 4-3 HOUSEHOLD RESPONSIBILITIES OF STUDENTS WITH DISABILITIES		
	Percentage	Standard Error
Straightened up own room or living area		
Always	23.1	1.0
Usually	17.0	.9
Sometimes	45.3	1.2
Never	14.6	.9
Fixed own breakfast or lunch		
Always	17.3	.9
Usually	17.2	.9
Sometimes	48.0	1.2
Never	17.6	.9
Did laundry		
Always	3.6	.5
Usually	3.7	.5
Sometimes	20.8	1.0
Never	71.9	1.1
Bought items needed at a store ^(a)		
Always	15.5	1.7
Usually	15.6	1.7
Sometimes	46.9	2.3
Never	22.0	1.9
Got around outside the home without help ^(a)		
Very well	70.1	2.2
Pretty well	11.4	1.5
Not very well or not at all well	18.5	
Household responsibilities scale score		
High (11 or 12)	2.5	.4
Medium (7 to 10)	36.8	1.2
Low (3 to 6)	60.7	1.2
Sample size	9,544	
Students age 12 or older	2,360	

^(a) Asked only about students 12 years old or older.

¹² Activities outside the home were not included in the scale because only parents of students who were 12 years old or older were asked about these activities.

for future independence, parents were asked how likely they thought it was that their child with a disability would achieve two common forms of independence for adolescents—obtaining a driver’s license and getting a paid job. To assess longer-term expectations for independence, parents were asked how likely they thought it was that their child would live alone in the future, on his or her own, without supervision. For each of these aspects of independence, parents’ responded whether they thought students “definitely would,” “probably would,” “probably wouldn’t,” or “definitely wouldn’t” achieve that aspect of independence.

Parents’ expectations of children’s future independence are strongly and consistently related to their self-care and functional mental skills. For example, 74% of students with high self-care skills (i.e., no trouble dressing and feeding themselves) were expected “definitely” to get a driver’s license; 81% were expected “definitely” to get a paid job; and 66% were expected “definitely” to live on their own without supervision, compared with 17%, 28%, and 18% of students whose self-care skills were low (i.e., some trouble dressing or feeding themselves; $p<.001$). Similarly, between 77% and 89% of those with high functional mental skills were expected to achieve these three aspects of independence, compared with between 32% and 47% of students with low functional mental skills ($p<.001$). This pattern of higher expectations for students with greater skill or responsibility is not nearly so strong on the household responsibilities scale. Although those with a high level of responsibility were more likely to be expected “definitely” to get a driver’s license or a paid job or to live independently than those with a low level of responsibility, the difference between the two groups is much smaller than was apparent for the self-care and functional mental skills scales.

Interestingly, however, having high skills or responsibilities did not give parents absolute confidence in the likelihood of their children achieving independence. For example, parents thought that 8% of those with high self-care skills, 5% of those with high functional mental skills, and 4% of those with a high level of household responsibilities would “definitely” or “probably” not be able to live alone independently in the future. Conversely, having low skills did not dissuade some parents from expecting that their children would be independent in the future. For example, among students with low self-care skills, 17% were expected “definitely” to obtain a driver’s license, 28% were expected “definitely” to get a paid job, and 18% were expected “definitely” to live alone independently.

Some degree of caution should be noted regarding these reports of parents’ expectations. Other SEELS analyses (Newman, Wagner, and Guzman, 2002) have indicated that parents’ expectations regarding future educational attainment are lower for older than for younger students. A similar pattern is apparent for parents’ expectations regarding some aspects of independence. For example, 61% of parents of students ages 6 to 9 “definitely” expected that they would obtain a paid job in the future, whereas only 46% of parents of students ages 13 or older had similarly high expectations ($p<.05$). It is unclear whether these lower expectations for older students occur because students’ increasing experience with daily living tasks as they age dampens parents’ optimism or whether the difference in the mix of disabilities between younger and older students, described in Chapter 2, results in higher expectations for younger than older students. Future waves of SEELS data collection will illuminate this issue, as parents are asked again about their expectations for their children as they transition from elementary to middle and middle to high school.

Exhibit 4-4
PARENTS' EXPECTATIONS FOR STUDENTS' FUTURE INDEPENDENCE, BY LEVEL OF
DAILY LIVING SKILLS AND RESPONSIBILITIES

	All Students	Students Whose Self-Care Skills Were:			Students Whose Functional Mental Skills Were:			Students Whose Self-Care Skills Were:		
		Low	Medium	High	Low	Medium	High	Low	Medium	High
Percentage with parents reporting the likelihood of student's:										
Getting a driver's license as:										
Definitely will	66.8 (1.1)	17.3 (3.6)	49.4 (2.6)	74.0 (1.3)	38.8 (2.3)	70.6 (1.6)	83.9 (1.8)	62.2 (1.5)	74.3 (1.8)	73.7 (7.3)
Probably will	25.9 (1.1)	28.1 (4.3)	34.8 (2.5)	22.8 (1.2)	37.8 (2.3)	26.2 (1.5)	14.8 (1.8)	28.1 (1.4)	22.5 (1.7)	19.8 (6.6)
Definitely or probably won't	7.3 (.6)	54.6 (4.8)	15.8 (1.9)	3.2 (.5)	23.4 (2.0)	3.3 (.6)	1.4 (.6)	9.7 (.9)	3.1 (7)	6.4 (4.0)
Getting a paid job as:										
Definitely will	74.2 (1.1)	28.5 (4.5)	58.4 (2.6)	80.7 (1.2)	46.8 (2.4)	78.8 (1.4)	89.1 (1.6)	69.4 (1.4)	81.8 (1.6)	88.8 (5.4)
Probably will	22.7 (1.0)	41.0 (4.9)	37.0 (2.5)	17.8 (1.1)	42.2 (2.4)	20.2 (1.4)	10.7 (1.6)	26.6 (1.4)	17.2 (1.6)	11.0 (5.2)
Definitely or probably won't	3.0 (.4)	30.6 (4.6)	4.5 (1.1)	1.5 (.4)	10.9 (1.5)	1.1 (.4)	.1 (.2)	4.0 (.6)	1.0 (.4)	1.2 (1.8)
Living on his/her own without supervision as:										
Definitely will	58.4 (1.2)	18.4 (3.8)	27.6 (1.5)	65.9 (1.4)	32.1 (2.2)	60.8 (1.7)	76.8 (2.1)	52.3 (1.5)	68.3 (1.9)	64.3 (8.1)
Probably will	29.0 (1.1)	21.9 (4.0)	40.8 (2.6)	26.0 (1.3)	37.4 (2.3)	30.6 (1.6)	18.3 (1.9)	32.0 (1.4)	24.1 (1.8)	31.8 (7.9)
Definitely or probably won't	12.6 (.8)	58.7 (4.8)	21.6 (2.2)	8.1 (.8)	30.5 (2.2)	8.6 (1.0)	4.8 (1.1)	15.7 (1.1)	7.6 (1.1)	3.8 (3.3)
Sample size: All students	9,372	1,056	2,803	5,105	3,193	4,241	1,840	6,359	2,813	148
Students not expected to live unsupervised	2,933	757	1,043	1,054	1,612	1,099	160	2,248	607	39

Standard errors are in parentheses.

Disability Differences in Daily Living Skills

Students with different primary disability classifications differed dramatically in the ability or frequency with which they performed the daily living activities described above.

Larger proportions of students in all disability categories performed self-care skills with "high" ability than they did functional mental skills (Exhibit 4-5). But dressing and feeding themselves were difficult tasks for some students. Only students with learning disabilities, speech impairments, or hearing impairments (at least 80%) performed both tasks with no trouble; 2% or fewer of these students reported difficulty with either activity. In contrast, more than one in five students with multiple disabilities scored in the low range on the self-care scale.

Exhibit 4-5
DAILY LIVING SKILLS, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impairment	Mental Retardation	Emotional Disturbance	Hearing Impairment	Visual Impairment	Orthopedic Impairment	Other Health Impairment	Autism	Traumatic Brain Injury	Multiple Disabilities	Deaf-Blindness
Percentage with self-care skills scale score:												
High (8)	80.8 (1.7)	87.1 (1.6)	56.4 (2.4)	67.2 (2.3)	79.8 (2.2)	44.9 (3.1)	35.4 (2.6)	59.4 (2.5)	33.8 (2.5)	47.1 (4.9)	35.0 (2.6)	12.2 (11.8)
Medium (5 to 7)	18.8 (1.7)	12.6 (1.6)	36.8 (2.3)	30.1 (2.3)	18.7 (2.2)	44.5 (3.1)	46.1 (2.7)	37.3 (2.5)	57.9 (2.6)	39.6 (4.8)	43.6 (2.7)	63.5 (17.3)
Low (2 to 4)	.4 (.3)	.2 (.2)	6.8 (1.2)	2.7 (.8)	1.6 (.7)	10.6 (1.9)	18.5 (2.1)	3.4 (.9)	8.3 (1.5)	13.3 (3.3)	21.4 (2.3)	24.3 (15.4)
Percentage with functional mental skills scale score:												
High (15 or 16)	23.2 (1.8)	32.3 (2.2)	6.4 (1.2)	27.7 (2.1)	23.2 (2.3)	17.0 (2.3)	22.6 (2.2)	28.3 (2.3)	9.9 (1.6)	10.9 (3.0)	9.4 (1.6)	6.6 (8.8)
Medium (9 to 14)	69.2 (2.0)	60.6 (2.3)	53.3 (2.4)	61.8 (2.3)	65.4 (2.6)	54.1 (3.1)	56.0 (2.7)	58.2 (2.5)	47.6 (2.6)	61.0 (4.8)	40.5 (2.7)	13.8 (12.3)
Low (4 to 8)	7.5 (1.1)	7.1 (1.2)	40.3 (2.3)	10.6 (1.4)	11.4 (1.7)	28.9 (2.8)	21.4 (2.2)	13.4 (1.7)	42.4 (2.6)	28.2 (4.4)	50.1 (2.8)	79.7 (14.3)
Percentage with household responsibilities scale score:												
High (11 or 12)	3.9 (.8)	1.7 (.6)	1.4 (.6)	1.2 (.5)	1.9 (.8)	1.1 (.6)	.5 (.4)	2.0 (.7)	.1 (.2)	1.1 (1.0)	1.4 (.6)	.5 (2.4)
Medium (7 to 10)	40.2 (2.1)	39.0 (2.3)	29.4 (2.2)	31.9 (2.2)	42.3 (2.7)	32.7 (2.8)	21.4 (2.2)	28.5 (2.3)	13.5 (1.8)	28.2 (4.4)	18.7 (2.1)	12.2 (11.6)
Low (3 to 6)	55.9 (2.1)	59.3 (2.3)	69.2 (2.2)	66.9 (2.2)	55.8 (2.7)	66.2 (2.8)	78.1 (2.2)	69.4 (2.3)	86.4 (1.8)	70.6 (4.5)	79.9 (2.2)	87.3 (11.8)
Sample size:	985	802	788	764	987	772	941	889	1,083	337	800	43

Standard errors are in parentheses.

In six disability categories, the proportion of students performing functional mental skills with high ability exceeded 20%: learning disability; emotional disturbance; and speech, hearing, orthopedic, and other health impairments. Even in these categories, however, from 7% to 21% of students scored in the low range on the functional mental skills scale.

Among students with mental retardation, autism, multiple disabilities, and deaf-blindness, from 40% to 80% of students scored in the low range on the functional mental skills scale, as did almost 30% of students with visual impairments or traumatic brain injuries. In these categories, from 6% to 17% of students performed functional mental skills with high ability.

More than half of the students in each disability category scored “low” on the household responsibilities scale, although there were fewer students with learning disabilities, speech/language impairments, and hearing impairments at the low end of the scale than students in other categories. More than three-fourths of students with orthopedic impairments, autism, multiple disabilities, and deaf-blindness scored “low” on the household responsibilities scale.

Demographic Differences in Daily Living Skills

Age. Many of the daily living activities we have considered are developmental, in that children’s ability or responsibility regarding them typically increases with age. In fact, age was a significant factor in parents’ ratings of the ability or frequency with which students performed the tasks of daily living, but it was a much greater factor for some activities than others (Exhibit 4-6).

There was a significant trend for greater self-care competence among older children (e.g., 74% of children ages 6 to 8 performed them with high skill, compared with 79% by ages 10 to 12; $p<.05$). This result was most strongly affected by the higher scores for dressing, whereas competence in feeding oneself typically is acquired before school age for most children.

There also was a markedly higher percentage of older students who performed functional mental skills with high competence. Those who scored “high” on the functional mental skills scale were 18% of those 6 to 8 years old and 31% of those 9 to 12 years old ($p<.001$).

Household responsibilities also were higher for the middle vs. the youngest age group; those scoring “low” on the household responsibility scale dropped from 68% among students 6 to 8 years of age to 54% among those ages 9 to 12 ($p<.001$), despite the absence of a significant increase in the proportion of parents who had rules for children’s chores at home. Perhaps it was the nature of chores that varied for older children, rather than the propensity to do chores at all. Somewhat surprisingly, there were no differences between younger and older students in skill ratings for activities outside the home.

Gender. There were no notable differences between boys and girls in their self-care or functional mental skills (Exhibit 4-6). However, girls were more likely than boys to carry out the particular household responsibilities addressed here, even though boys and girls were equally likely to have rules at home about performing household chores. Boys were significantly more likely than girls to be rated “low” in these household responsibilities (54% vs. 64%; $p<.001$). Differences in the scale score resulted primarily from girls’ being more likely to straighten their rooms, make their own breakfast or lunch, and do laundry; there were no differences between boys and girls in activities outside the home.

Exhibit 4-6
DAILY LIVING SKILLS, BY STUDENTS' AGE AND GENDER

Daily Living Scale Scores	Age			Gender	
	6 to 8	9 to 12	13 or older	Boys	Girls
Percentage with self-care skills scale score:					
High (8)	74.2 (1.5)	78.9 (1.5)	81.8 (5.9)	75.9 (1.2)	78.6 (1.8)
Medium (5 to 7)	23.1 (1.5)	19.8 (1.4)	17.6 (5.8)	22.2 (1.3)	19.3 (1.7)
Low (2 to 4)	2.7 (.6)	1.4 (.4)	.5 (1.1)	2.0 (.4)	2.1 (.6)
Percentage with functional mental skills scale score:					
High (15 or 16)	18.2 (1.3)	30.9 (1.6)	30.0 (6.6)	25.3 (1.3)	24.2 (1.8)
Medium (9 to 14)	64.7 (1.6)	61.3 (1.7)	59.3 (7.1)	62.7 (1.4)	62.3 (2.0)
Low (4 to 8)	17.0 (1.3)	7.8 (.9)	10.6 (4.4)	12.0 (1.0)	13.5 (1.4)
Percentage with household responsibilities scale score:					
High (11 or 12)	1.5 (.4)	3.2 (.6)	7.7 (3.8)	2.1 (.4)	3.4 (.8)
Medium (7 to 10)	30.6 (1.6)	42.8 (1.7)	43.2 (7.1)	34.3 (1.4)	42.2 (2.1)
Low (3 to 6)	68.0 (1.6)	54.0 (1.7)	49.1 (7.1)	63.6 (1.4)	54.5 (2.1)
Sample size	4,759	4,187	270	5,653	2,869

Standard errors are in parentheses.

Household income. Students from lower-income households were less likely than others to perform self-care and functional mental skills with high ability (Exhibit 4-7). Overall, 71% of those with annual household incomes of \$25,000 or less performed self-care skills with high competence, compared with 81% of those in the middle-income group ($p<.001$) and 78% of those in the upper-income group ($p<.01$). Similarly, functional mental skills were performed with greater competence among those in the upper-income (32%) and middle-income groups (27%), compared with the lower-income group (20%; $p<.001$ and $p<.01$, respectively). Despite the fact that few students in any income group were rated “high” in their frequency of performing household responsibilities, students from the lower-income group were rated significantly higher than students from wealthier households, largely because they were more likely to do activities outside the home. No differences between students in different income categories were evident in the extent to which they had rules at home governing household chores, suggesting that the difference between students may have been in the particular chores they were asked to do, not in whether they did chores at all.

Race/ethnicity. The proportions of white, African American, Hispanic, and American Indian/Alaska Native students who performed self-care skills with high competence were quite

similar (Exhibit 4-7), ranging from 70% to 78%. Although Asian/Pacific Islander students were less likely to rate “high” on the self-care scale (60% did so), the differences were not statistically significant because of the small number of students in this group.

White, Hispanic, and Asian/Pacific Islander students were about equally likely to be rated “high” in their functional mental skills (22% to 27%). However, African American students were significantly less likely to be rated as highly competent in their functional mental skills (19%; $p < .01$ compared with white students). American Indian/Alaska Native students also were rated highly less often. Regarding frequency of household responsibilities, however, African American and Hispanic students were more likely than others to perform them with “high” frequency (e.g., 5% of African American students, compared with 2% of white students, $p < .05$, and no Asian/Pacific Islander students, $p < .01$), despite the fact that African American and white students were equally likely to be subject to rules about household chores at home and Hispanic students were less likely than others to have such roles.

Exhibit 4-7
DAILY LIVING SKILLS, BY INCOME AND RACE/ETHNICITY

Daily Living Scale Scores	Income			Race/Ethnicity				
	\$25,000 or Less	\$25,001 to \$50,000	More than \$50,000	White	African American	Hispanic	Asian/Pacific Islander	American Indian/Alaska Native
Percentage with self-care skills scale score:								
High (8)	71.4 (1.9)	81.0 (1.9)	78.5 (1.9)	78.5 (1.2)	74.8 (2.5)	72.7 (3.3)	60.3 (11.1)	69.9 (13.9)
Medium (5 to 7)	25.8 (1.8)	17.5 (1.8)	19.9 (1.8)	19.9 (1.2)	22.7 (2.4)	24.3 (3.2)	36.8 (10.9)	29.6 (13.8)
Low (2 to 4)	2.9 (.7)	1.6 (.6)	1.6 (.6)	1.6 (.4)	2.5 (.9)	3.0 (1.3)	3.0 (3.8)	.5 (2.2)
Percentage with functional mental skills scale score:								
High (15 or 16)	20.5 (1.6)	27.2 (2.0)	31.5 (2.1)	26.7 (1.3)	18.8 (2.2)	25.1 (3.2)	22.2 (9.2)	15.7 (11.2)
Medium (9 to 14)	62.6 (2.0)	60.8 (2.2)	61.5 (2.2)	63.6 (1.4)	62.5 (2.7)	59.9 (3.6)	62.6 (10.7)	78.9 (12.6)
Low (4 to 8)	17.0 (1.5)	12.0 (1.5)	7.0 (1.1)	9.8 (.9)	18.8 (2.2)	15.0 (2.6)	15.3 (7.9)	5.4 (7.0)
Percentage with household responsibilities scale score:								
High (11 or 12)	3.4 (.7)	1.8 (.6)	1.5 (.5)	1.6 (.4)	4.6 (1.2)	4.1 (1.4)	.0 (.0)	8.6 (8.6)
Medium (7 to 10)	33.5 (1.9)	39.9 (2.3)	36.8 (2.2)	36.3 (1.4)	38.0 (2.7)	34.8 (3.5)	48.4 (10.9)	34.6 (14.6)
Low (3 to 6)	63.1 (1.9)	58.3 (2.3)	61.8 (2.2)	62.0 (1.4)	57.4 (2.7)	61.1 (3.5)	51.6 (10.9)	56.9 (15.2)
Sample size	3,282	2,340	2,887	5,814	1,896	1,152	194	61

Standard errors are in parentheses.

Social Functioning

The importance of childhood social interactions for positive child development is well established. Competence in social exchanges is a key factor in school engagement and academic success, whereas problems in social functioning usually indicate difficulties in multiple domains (Magnusson & Bergman, 1990).

Social interplay begins early in life, in the process of attachment with caregivers. Some hold that these primary relationships are predictive of later adjustment, with positive early attachments leading to prosocial alliances in childhood and adolescence. Friendships and peer relations also can influence strongly the attitudes, preferences, and activities of children and adolescents (Parker & Asher, 1987). Favorable peer relations can support adaptive behavior and indicate desirable social, emotional, and cognitive development (Coie, 1990; Dodge, 1990), whereas social isolation has been associated with confrontational, aggressive, and self-destructive behavior in children and adults (Cairns, 1979; Cairns & Cairns, 1994).

Students receiving special education include a disproportionate number of students who are at high risk for delays or difficulties in social development, perhaps particularly students with autism and emotional disturbances. However, parents reported that some students with all primary disability classifications had these kinds of disabilities as secondary conditions (Wagner 2002). Students with these kinds of disabilities are most likely to be targeted for functional behavioral assessment and behavioral intervention plans.

Functional behavioral assessment and behavioral intervention plans were mandated by the 1997 amendments to the Individuals with Disabilities Education Act (IDEA '97) for students exhibiting behaviors that interfere with the educational process. IDEA '97 proposes that a multidisciplinary child study team conduct the assessment to identify both the underlying processes giving rise to the student's lack of cooperation and the activities and goals of an intervention. The functional behavioral assessment and behavioral intervention plan may be viewed as a single, integrated, continuous process (Jolivette, Scott, & Nelson, 2000). The trend in functional behavioral assessment has been toward a holistic assessment of children and the provision of wraparound services that address their educational, psychological, and maturational status (Miller, Tansy, & Hughes, 1998).

IDEA '97 posits that understanding the relationship between learning and behavior is crucial to planning an individualized education program, whose goal is to give students with disabilities access to the general curriculum. The amendments do not specify the problem behaviors to be addressed. One of the concerns of educators is the possibility of contextual conditions or rater bias giving rise to the overidentification of some kinds of students. SEELS helps to shed light on these questions by providing behavioral data for students nationally and in each disability category, thereby establishing benchmarks against which the effects of national, regional, and local programs can be evaluated.

Parents' reports of students' social skills are provided here to assess general social competence; the extent to which parents reported that children 12 years old or older had been arrested also is reported, as an important marker of their social adjustment in the community.

Social Skills of Students with Disabilities

The social skills of students with disabilities were assessed by using questions to parents that were drawn from the Social Skills Rating System, Parent Form (Gresham & Elliot, 1990). Parents responded to 18 questions that addressed three areas of their children's social ability:

- **Assertion**—the ability and willingness to become involved in social activities (e.g., joins groups without being told).
- **Self-control**—the ability to cope with frustration and to deal with conflict (e.g., ends disagreements calmly).
- **Cooperation**—the ability to cooperate and stay on task (e.g., cooperates with family members without being asked to do so).

A scale was created to measure each of these areas of social ability. The assertion and self-control scales range from 0 to 8 and have mean scores of 5 for this population of students. The cooperation scale ranges from 0 to 6 and has a mean of 4 for students with disabilities. A fourth scale was created by summing these three scales to create a broad measure of general social skills; it ranges from 0 to 22 and has a mean of 14. Ratings are categorized as high (more than one standard deviation above the mean), medium (within one standard deviation of the mean), and low (more than one standard deviation below the mean).

Eighty-eight percent of the students receiving special education were rated by their parents as medium or high on social skills (Exhibit 4-8), broadly defined. Students received highest scores for assertion, with almost one-third (32%) scoring high and 92% being rated medium or high. Scores for the self-control and cooperation scales were similar, with about one in six students scoring high, and 88% and 86% receiving a medium or high rating, respectively. From 8% to 14% were rated low on these two scales.

The three scales were identified by factor analysis. Estimated factor score coefficients (Bartlett method) were used to determine correlations among the factors. The correlation between the assertion and self-control factors was $r = .31$, $p < .01$; the correlation between the assertion and cooperation factors was $r = .29$, $p < .01$. The self-control and cooperation factors were correlated at $r = .42$, $p < .01$. Modest correlations were noted between these factors and the measures of self-care, mental skills, and household responsibilities described above ($r < .27$ in all analyses).

Relatively low correlations between daily living and social skills might result from parents' being more conservative in their assessment of daily skills and less critical when it comes to the question of social ability. Or the effect of poor daily living skills on social adjustment may be felt only as students age and are expected to behave more independently. An alternative explanation for low correlations between the measures is that problems with daily living skills are not a necessary or sufficient cause for problems with social adjustment. Individuals with functional difficulties in one domain may have significant competencies in other areas. To consider the impact of social skills, it may be necessary to look at domains that are concretely related to social functioning. For example, social skills ratings did relate to trouble at school. Parents rated 88% of the students who had been suspended or expelled from school as medium or low on the assertion scale, 95% as medium or low on the self-control scale, and 94% as medium or low on the cooperation scale. Parents also rated the relationship between students and teachers. Ninety-

three percent of the students who got along “very well” with teachers received medium or high social skills ratings. These students accounted for 63% of the sample. At the opposite end of the scale, parents described 1% of students as “not at all” able to get along with teachers. Of that group, 93% received medium or low scores on the overall social skills ratings.

Exhibit 4-8 SOCIAL SKILLS OF STUDENTS WITH DISABILITIES		
	<u>Percentage</u>	<u>Standard Error</u>
Percentage with overall social skills rated:		
High	19.9	1.0
Medium	67.6	1.1
Low	12.6	.8
Percentage with assertion skills rated:		
High	31.8	1.1
Medium	60.4	1.2
Low	7.9	.7
Percentage with self- control skills rated:		
High	17.7	.9
Medium	70.0	1.1
Low	12.3	.8
Percentage with cooperation skills rated:		
High	15.4	.9
Medium	70.7	1.1
Low	13.9	.8
Sample size	9,552	

Disability Differences in Social Skills

There are reasons to expect that differences in disabilities could influence students’ social skills. For example, we might expect that students with cognitive or speech/language limitations could have problems with social functioning because of communication difficulties. As noted in the preceding chapter, the abilities to express personal intentions and expectations and to recognize the intentions of others are key ingredients in social relationships. Difficulties in expressing oneself or understanding others could undermine social interactions and limit the ability both to promote prosocial behavior and to shape the process of self-identification. Challenges to social functioning that result from limits in perceptual or expressive ability also may lead to frustration and withdrawal from social interchanges. Children who cannot or do not engage in social contact have limited exposure to the reciprocity that guides much of our intra- and interpersonal development.

Exhibit 4-9 depicts ratings for total scale scores and the three social skills measures for students with different primary disabilities. Students identified with learning disabilities or with hearing, speech, vision, orthopedic, or other health impairments had overall social skills that were ranked above the mean for students in this population. Among students with these disabilities, 84% (other health impairments) to 93% (speech/language impairments) were given medium or high overall ratings by their parents. Students with mental retardation, deaf-blindness, traumatic brain injury, or multiple disabilities had ratings that indicated shortfalls in social competence, with 19% to 41% scoring low on the overall scale.

Students with learning disabilities or with hearing, vision, speech, orthopedic, or other health impairments received positive marks from their parents across the three social skills rating scales; 86% to 90% of students with visual impairments ranked in the medium or high range across the three social ability measures. Reports from the parents of youth diagnosed with autism, deaf-blindness, traumatic brain injury, or multiple disabilities were less positive, with

Exhibit 4-9
STUDENTS' SOCIAL SKILLS, BY DISABILITY CATEGORY

	Learning Disabilities	Speech/ Language Impairment	Emotional Disturbance	Mental Retardation	Hearing Impairment	Visual Impairment	Orthopedic Impairment	Other Health Impairment	Autism	Traumatic Brain Injury	Multiple Disabilities	Deaf-Blindness
Percentage with overall social skills rated:												
High	19.8 (1.7)	26.5 (2.1)	6.1 (1.1)	10.4 (1.4)	20.4 (2.2)	27.8 (2.7)	22.4 (2.2)	15.5 (1.8)	5.5 (1.2)	13.0 (3.3)	10.4 (1.7)	4.2 (7.4)
Medium	68.6 (2.0)	66.3 (2.2)	66.8 (2.2)	69.5 (2.2)	68.0 (2.6)	59.4 (3.0)	68.2 (2.5)	68.7 (2.3)	58.6 (2.6)	68.0 (4.6)	64.9 (2.6)	54.5 (18.2)
Low	11.5 (1.4)	7.2 (1.2)	27.1 (2.1)	20.1 (1.9)	11.6 (1.8)	12.8 (2.0)	9.5 (1.6)	15.9 (1.8)	35.9 (2.6)	19.0 (3.8)	24.7 (2.4)	41.2 (18.0)
Percentage with assertion skills rated:												
High	30.9 (2.0)	40.4 (2.3)	20.8 (1.9)	21.2 (1.9)	30.9 (2.5)	31.8 (2.8)	31.3 (2.5)	27.9 (2.2)	6.4 (1.3)	18.3 (3.8)	17.3 (2.1)	3.6 (6.8)
Medium	62.0 (2.1)	54.6 (2.3)	67.9 (2.2)	66.8 (2.2)	61.7 (2.7)	56.5 (3.0)	59.7 (2.6)	63.9 (2.4)	56.1 (2.6)	67.6 (4.6)	65.0 (2.6)	82.2 (14.0)
Low	7.1 (1.1)	5.0 (1.0)	11.3 (1.5)	12.1 (1.5)	7.4 (1.4)	11.7 (1.9)	9.0 (1.5)	8.2 (1.4)	37.5 (2.6)	14.1 (3.4)	17.7 (2.1)	14.3 (12.8)
Percentage with self-control skills rated:												
High	17.4 (1.6)	22.4 (2.0)	5.0 (1.0)	12.4 (1.6)	15.8 (2.0)	21.8 (2.5)	22.5 (2.2)	15.4 (1.8)	12.5 (1.8)	14.8 (3.5)	13.0 (1.8)	5.7 (8.5)
Medium	70.9 (1.9)	69.6 (2.2)	66.3 (2.2)	70.7 (2.1)	73.0 (2.4)	68.2 (2.8)	66.9 (2.5)	67.9 (2.3)	71.1 (2.4)	69.5 (4.5)	71.6 (2.5)	72.5 (16.3)
Low	11.7 (1.4)	7.9 (1.3)	28.7 (2.1)	16.8 (1.8)	11.1 (1.7)	10.0 (1.8)	10.6 (1.6)	16.8 (1.9)	16.4 (2.0)	15.8 (3.6)	15.4 (2.0)	21.8 (15.1)
Percentage with cooperation skills rated:												
High	15.6 (1.5)	19.1 (1.8)	5.6 (1.1)	10.3 (1.4)	15.5 (2.0)	22.0 (2.5)	18.9 (2.1)	10.9 (1.6)	8.9 (1.5)	11.2 (3.1)	10.4 (1.7)	19.1 (14.4)
Medium	70.8 (1.9)	71.3 (2.1)	70.9 (2.1)	69.9 (2.2)	71.8 (2.5)	64.1 (2.9)	69.0 (2.5)	72.4 (2.2)	65.8 (2.5)	66.5 (4.6)	64.7 (2.6)	39.8 (17.9)
Low	13.6 (1.5)	9.6 (1.4)	23.5 (2.0)	19.7 (1.9)	12.8 (1.8)	13.9 (2.1)	12.1 (1.7)	16.8 (1.9)	25.3 (2.3)	22.3 (4.1)	24.9 (2.4)	41.0 (18.0)
Sample size	1,030	822	860	843	1,013	797	964	920	1,092	351	808	43

Standard errors are in parentheses.

more of these students rated as low or medium in skills across the three domains. Students with mental retardation received ratings on the assertion scale that were comparable to those of students identified with emotional disturbances. The parents of students with mental retardation said that most of their children had medium or high self-control (83%), whereas 80% were given medium or high ratings for cooperation.

Of course, difficulty in social situations is a diagnostic criterion for children with autism and emotional/disturbances, and social skills ratings for these students were correspondingly low. Among students with emotional disturbances, ratings of assertion stood out in contrast to ratings received for self-control and cooperation. Eighty-nine percent of students with emotional disturbances were rated medium or high on the assertion measure, whereas parents described 95% of these students as having medium or low self-control and cooperation skills. In contrast, parents of children with autism said that only 6% of their children were high in assertion skills, but these children scored slightly higher on self-control and cooperation than students with emotional disturbances.

These findings indicate that students with emotional disturbances were willing participants in social interchanges. According to their parents, students with emotional disturbances were not necessarily anti-social, shy, or withdrawn. Most were willing and able to engage others on several levels. They received positive ratings on items such as “joins groups without being told,” “makes friends easily,” “seems confident in social situations, such as parties and outings,” and “starts conversations rather than waiting for others to start.” These reports lend further support to evidence that peer rejection and social ostracism are not the inevitable burden of children with behavioral and emotional difficulties. There is a growing body of evidence that youth with certain behavioral problems, including students who are highly aggressive, are likely to have friends, to belong to social groups, and even to be central figures in those groups (Farmer & Farmer 1996; Rodkin, Farmer, Pearl, & Van Acker, 2000; Sandstrom & Coie, 1999). It may be possible to build on the behavioral competencies of these students in ways that further the goals of IDEA. For example, peer-based interventions offer a promising avenue for behavior management in the classroom context (Farmer & Cadwallader, 2000).

Demographic Differences in Social Skills

Age. There was a downward trend in overall social skills ratings with increasing age (Exhibit 4-10). There are at least two possible reasons for this phenomenon. First, the tendency of parents to give lower ratings to older students may reflect the changing mix of disabilities represented by the different age cohorts; students with greater difficulties were more likely to have continued receiving special education as they got older, and emotional issues were just emerging for some students, causing an influx of more students with emotional disturbances. Second, students may have been held to different standards of conduct with increasing age. For example, hitting is tolerated more among kindergartners than it is among middle school students.

Gender. On the whole, the gender difference in social skills ratings was negligible (Exhibit 4-10). Overall differences between male and female students with disabilities were consistent with those found among the general population of students at this age. Differences in social characteristics of boys and girls emerge with increasing age. The interests and activities of boys and girls have been shown to differ as they enter adolescence, with boys preferring group and

Exhibit 4-10
STUDENTS' SOCIAL SKILLS, BY AGE AND GENDER

	Age			Gender	
	6 to 9	10 to 12	13 or older	Boys	Girls
Percentage with overall social skills rated:					
High	22.2 (1.4)	17.6 (1.3)	16.8 (5.4)	19.2 (1.2)	21.3 (1.7)
Medium	66.0 (1.6)	69.0 (1.6)	69.8 (6.6)	67.8 (1.4)	67.3 (2.0)
Low	11.8 (1.1)	13.4 (1.2)	13.4 (4.9)	13.1 (1.0)	11.4 (1.3)
Percentage with assertion skills rated:					
High	36.3 (1.6)	27.9 (1.6)	20.7 (5.8)	30.8 (1.4)	33.6 (2.0)
Medium	56.5 (1.7)	63.7 (1.7)	70.2 (6.6)	61.1 (1.4)	59.5 (2.1)
Low	7.3 (.9)	8.4 (1.0)	9.1 (4.2)	8.1 (.8)	6.9 (1.1)
Percentage with self-control skills rated:					
High	19.0 (1.3)	16.5 (1.3)	16.2 (5.3)	17.2 (1.1)	18.7 (1.7)
Medium	68.8 (1.6)	71.2 (1.6)	71.2 (6.5)	70.5 (1.4)	69.8 (1.9)
Low	12.2 (1.1)	12.3 (1.1)	12.6 (4.8)	12.3 (1.0)	11.4 (1.4)
Percentage with cooperation skills rated:					
High	15.9 (1.3)	14.5 (1.2)	20.1 (5.8)	14.3 (1.0)	17.6 (1.6)
Medium	71.1 (1.6)	70.6 (1.6)	67.5 (6.8)	71.9 (1.3)	68.8 (2.0)
Low	13.0 (1.2)	14.9 (1.2)	12.4 (4.8)	13.9 (1.0)	13.6 (1.4)
Sample size	4,884	4,373	286	6,220	3,203

Standard errors are in parentheses.

competitive activities, while girls seek more intimate, cooperative activities involving just two people (Berndt & Savin-Williams, 1993). In general, girls desist in the use of physical aggression at a younger age than boys and turn to more subtle forms of social influence as they approach puberty (Xie, Cairns, & Cairns, 1998).

Household income. There was a consistent relationship between income and social skills ratings (Exhibit 4-11). Ratings of assertion, self-control, and cooperation were higher among higher-income groups. Higher ratings from one income level to the next were statistically significant ($p < .001$) across the three social skills areas. Differences in social skills as a function of income may reflect differences in such factors as access to pre- and postnatal medical care, and early intervention for emotional and behavioral disabilities. This hypothesis is consistent with the finding that there is a relationship between the nature of the disability and the social skills rating, as discussed above.

Exhibit 4-11
STUDENTS' SOCIAL SKILLS, BY INCOME AND RACE/ETHNICITY

	Income			Race/Ethnicity				
	\$25,000 or Less	\$25,001 to \$50,000	More than \$50,000	White	African American	Hispanic	Asian/ Pacific Islander	American Indian/ Alaska Native
Percentage with overall social skills rated:								
High	13.5 (1.4)	21.5 (1.9)	27.4 (2.0)	21.7 (1.2)	16.1 (2.0)	16.2 (2.7)	9.6 (6.4)	36.8 (14.8)
Medium	68.3 (1.9)	68.0 (2.2)	65.8 (2.1)	67.0 (1.4)	69.8 (2.5)	68.4 (3.4)	68.7 (10.1)	55.9 (15.3)
Low	18.2 (1.5)	10.5 (1.4)	6.8 (1.1)	11.3 (.9)	14.1 (1.9)	15.4 (2.6)	21.7 (9.0)	7.3 (8.0)
Percentage with assertion skills rated:								
High	22.7 (1.7)	33.9 (2.2)	41.0 (2.2)	35.8 (1.4)	25.6 (2.4)	21.5 (3.0)	19.6 (8.6)	58.5 (15.2)
Medium	66.8 (1.9)	60.0 (2.3)	53.4 (2.2)	57.5 (1.4)	67.5 (2.6)	64.3 (3.5)	74.2 (9.5)	30.3 (14.1)
Low	10.5 (1.2)	6.1 (1.1)	5.5 (1.0)	6.6 (.7)	7.0 (1.4)	14.3 (2.5)	6.1 (5.2)	11.2 (9.7)
Percentage with self- control skills rated:								
High	12.9 (1.3)	18.5 (1.8)	23.6 (1.9)	19.5 (1.2)	12.8 (1.8)	16.2 (2.7)	13.6 (7.5)	8.2 (8.4)
Medium	69.4 (1.9)	70.8 (2.1)	70.7 (2.0)	69.5 (1.3)	71.8 (2.5)	70.1 (3.3)	71.8 (9.8)	80.0 (12.3)
Low	17.7 (1.5)	10.7 (1.4)	5.7 (1.0)	10.9 (.9)	15.4 (2.0)	13.7 (2.5)	14.5 (7.7)	11.8 (9.9)
Percentage with cooperation skills rated:								
High	15.5 (1.5)	15.3 (1.7)	16.6 (1.7)	14.4 (1.0)	16.0 (2.0)	18.8 (2.8)	13.2 (7.4)	7.5 (8.1)
Medium	66.1 (1.9)	72.7 (2.1)	75.2 (1.9)	73.0 (1.3)	66.6 (2.6)	65.9 (3.5)	70.5 (9.9)	85.0 (11.0)
Low	18.4 (1.6)	12.0 (1.5)	8.1 (1.2)	12.7 (1.0)	17.4 (2.1)	15.3 (2.6)	16.2 (8.0)	7.5 (8.1)
Sample size	3,434	2,441	2,959	5,978	2,012	1,192	202	60

Standard errors are in parentheses.

Race/ethnicity. On most social skills domains, parents of white students rated their children more highly than did parents of children of African American, Hispanic, and Asian/Pacific Islander origins (Exhibit 4-11). This was the case for overall social skills and is characteristic of the assertion and self-control scales. Notably, the trend did not hold for ratings of cooperation, with African American and Hispanic parents giving higher ratings to their children than white parents. American Indian/Alaska Native children provide an interesting exception to this trend, but the small size of this group means that differences did not attain statistical significance.

Caution is always warranted when considering ethnic and racial differences on rating scales. There may have been real ethnic/racial differences in social skills among children, there may

have been differences in interpretation of the questions, or there may have been cultural differences in the importance or relevance of a particular domain. For example, it may be that white parents placed less emphasis on cooperation than they did on assertion or self-control, compared with African American or Hispanic parents. It will be instructive to compare data from teachers with parent ratings on these four scales, when those data become available, to see if the pattern demonstrated by parents is maintained.

Reports of Arrest

Reports of arrests were obtained from parents of students with disabilities who were age 12 or older. Overall, almost 3% of these students had been arrested. According to the 1999 national report on juvenile offenders and their victims (Snyder & Sickmund, 1999), fewer than 1% of the general juvenile population were arrested at age 13 years old or younger. This

Exhibit 4-12
STUDENTS AGE 12 OR OLDER:
SOCIAL SKILLS AND ARRESTS

	Arrested	
	No	Yes
Percentage with overall social skills rated:		
High	18.4 (1.9)	17.8 (9.4)
Medium	68.9 (2.3)	63.2 (11.9)
Low	12.6 (1.6)	19.0 (9.7)
Percentage with assertion s kills rated:		
High	25.0 (2.1)	37.1 (11.9)
Medium	66.5 (2.3)	56.2 (12.2)
Low	8.5 (1.4)	6.7 (6.2)
Percentage with self-control skills rated:		
High	17.0 (1.9)	7.1 (6.3)
Medium	70.1 (2.3)	81.8 (9.5)
Low	12.9 (1.7)	11.0 (7.7)
Percentage with cooperation skills rated:		
High	17.2 (1.9)	2.9 (4.1)
Medium	67.9 (2.3)	79.2 (10.0)
Low	14.8 (1.7)	17.9 (9.4)
Sample size	2,292	78

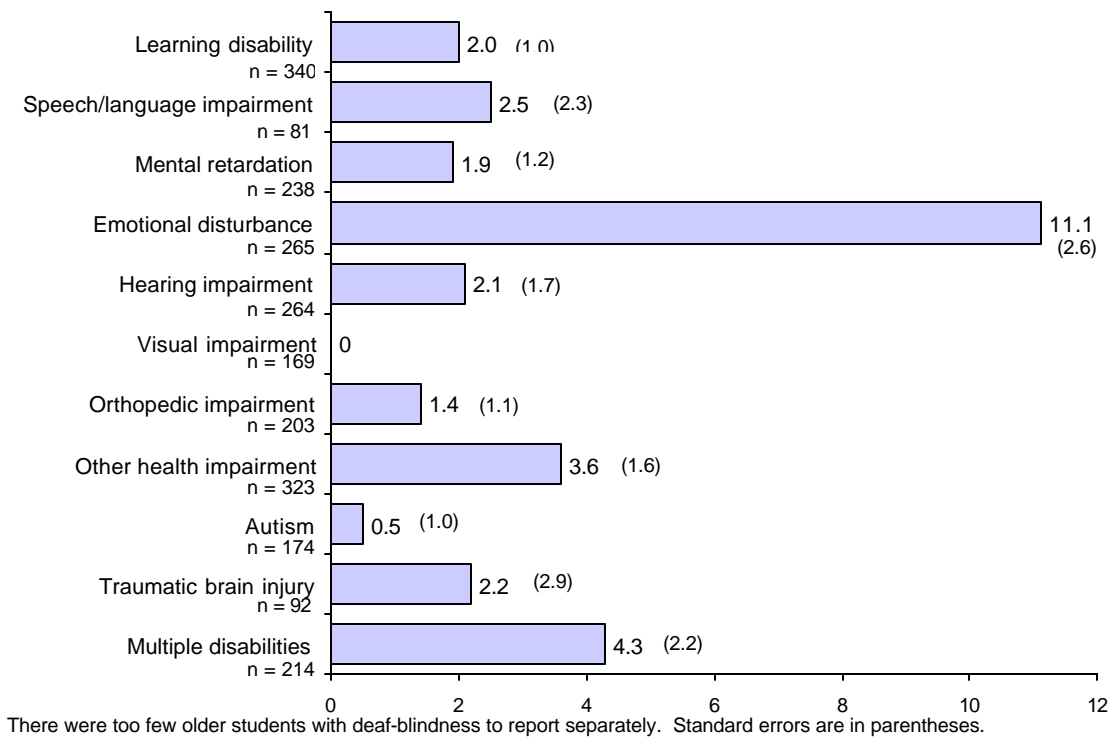
Standard errors are in parentheses.

difference between students with disabilities and those in the general population is small, but could become problematic if the gap grows as students age.

The relationship of social skills ratings to arrest rates may be instructive (Exhibit 4-12). On one hand, students who had been arrested had higher assertion skills than their nonarrested counterparts; they were not shy in social situations. On the other hand, arrested students had much lower ratings than their peers on the self-control and cooperation scales. Thus, the social skills limitations of some students with disabilities may have been playing out as greater difficulty abiding by the social norms of their communities.

Exhibit 4-13 shows the distribution of arrest rates by disability category. Students with emotional disturbances were arrested at a high rate relative to students with other disabilities. Among students with emotional disturbances 12 years old or older, 11% had been arrested. Although conduct problems and antisocial behavior were characteristic of many students in this group, it is striking that more than 1 in 10 of these students had been arrested while in elementary or middle school. Almost 4% of students with other health impairments also had been arrested—the category of disability that includes attention deficit and attention deficit/hyperactivity disorders.

Exhibit 4-13
STUDENTS 12 OR OLDER WHO HAD BEEN ARRESTED



Arrest rates were higher among older students; 2% of 12-year-olds receiving special education had been arrested, compared with 7% of 13-year-olds. Differences by household income were in a predictable direction; in families with household incomes of \$25,000 or less, 5% of the students had been arrested. This number dropped to 3% of students from households with incomes between \$25,000 and \$50,000. When the annual household income was more than \$50,000, only 1% of the students from those homes had been arrested.

A higher proportion of African American students had been arrested than students of other races. Of the students age 12 or older, 7% of African American students had been arrested, as compared to 2% of white and 1% of Hispanic students. None of the parents of students of other racial or ethnic origins reported that their children had been arrested.

It is important to note that the standard errors of these arrest rates are high, and differences in the proportions of students arrested between racial/ethnic groups were not statistically significant, i.e., they could have occurred by chance. However, these findings are consistent with national reports of juvenile arrests. African American youth were 15% of the general juvenile population in the United States, yet they accounted for 26% of the juvenile arrests in 1999 (Snyder & Sickmund, 1999). Thus, findings for young students with disabilities are in line with other reports of arrest rates. These findings emphasize the importance of longitudinal investigations in the development of social behavior. As these students age, answers to questions of race, social class, and behavioral outcomes will become increasingly substantive and reliable.

Another thing we do not know about the young people who had been arrested are the reasons for arrest. Presumably, many of these students were picked up for status offenses, such as truancy, runaway, or curfew violations. Whatever their offenses, these students were on the leading edge of a spike in arrest rates that typically begins in early adolescence. Because, national arrest rates for the general population are based on cross-sectional reports of numbers of arrests, not numbers of persons, it is not clear if the number of persons arrested increases during adolescence or if there is an increase in the number and severity of offenses as recidivists get older, or both. In any event, being arrested at the age of 12 is unlikely to bode well for later social adjustment.

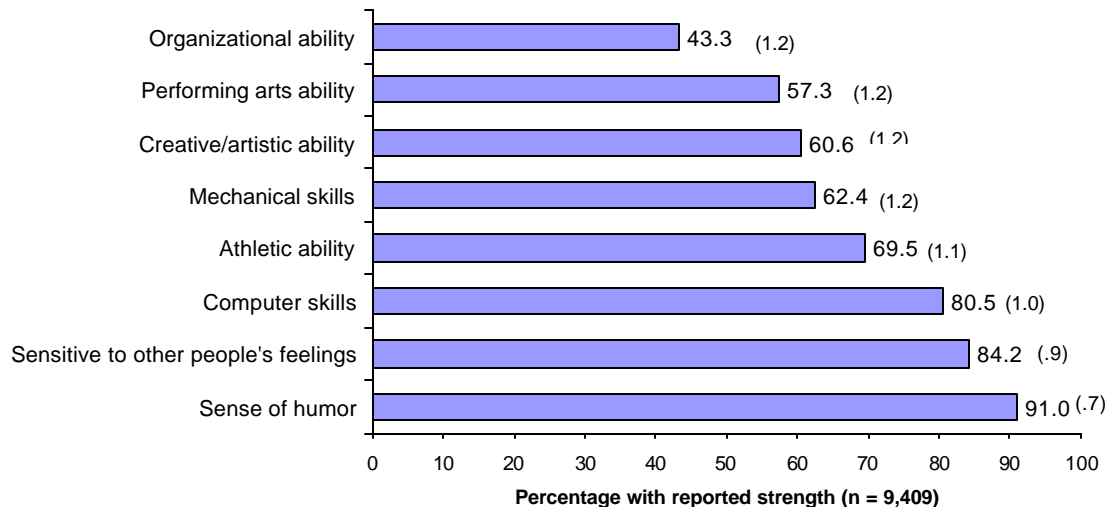
Some research has shown that some aspects of early behavior are predictive of later functioning. For example, assaultive conduct in childhood is a well-recognized risk factor for later maladjustment (Robins & Price, 1991; Roff & Wirt, 1984). In contrast, current evidence suggests that many highly aggressive children are not particularly prone to misconduct as teens (Nagin & Tremblay, 1999; Robins & Rutter, 1990; Stanger, Achenbach, & Verhulst, 1997), whereas some children with no history of early conduct problems get into trouble during the teen years. Differences in the age of onset of antisocial conduct may suggest differences in the causes, characteristics, and stability of those behaviors (Loeber & Hay, 1997; Loeber & Stouthamer-Loeber, 1998). Accordingly, intervention programs designed to respond to early behavioral difficulties may be inadequate to deal with the problems faced by students with social functioning difficulties that emerge in middle childhood and beyond. Access to effective programs is important to students across the age range, particularly programs that are tailored to the specific issues that emerge at different developmental stages.

Parents' Reports of Students' Strengths

The skills and abilities described thus far focus on areas of functioning that are important to students' abilities to participate and succeed at home, in school, and in their communities. However, they do not define all the areas in which students could demonstrate aptitude. To identify other strengths or abilities of students, parents were asked whether their children were "strong in: being well organized, performing arts abilities (such as music, dance or theater), creative or artistic ability (like drawing, writing, or poetry), being sensitive to other people's feelings, mechanical ability (like building or fixing things), computer use, athletic ability, or having a sense of humor."

Parents perceived a sizable percentage of children as having aptitude in each of these areas (Exhibit 4-14). The largest proportions of children were reported to be strong in the two areas that are personality traits, rather than specific skills: having a sense of humor (91%) and being sensitive to others' feelings (84%). However, many students also were reported to have specific abilities, the most prominent being computer use. Almost 70% of students were reported to have an aptitude for athletics, whereas more than 60% were mechanically inclined or had creative/artistic abilities. Performing arts and organizational skills were particular strengths of 57% and 43% of students, according to their parents.

Exhibit 4-14
PARENTS' REPORTS OF STRENGTHS OF
STUDENTS WITH DISABILITIES



Standard errors are in parentheses

Relationships of Social Skills and Student Strengths

Social ratings were positively related to student strengths (Exhibit 4-15). As might be expected, students who had a sense of humor and/or were sensitive to others fared well in estimations of their social competence. Athleticism was a moderately better predictor of social skills than were computer skills, mechanical ability, performing arts, or creativity, perhaps because the cooperative nature of many team sports attracts students with good social skills or instills them in athletes who participate in team sports, in contrast with the more individual activities involved in the other ability areas. Organizational ability also had a strong positive relationship to social skills ratings. Further, there was evidence of a cumulative relationship between student strengths and social adaptation. The more areas of strength a parent mentioned, the more likely the student was to rank high on the overall social skills measure ($r = .40$, $p < .01$).

Perhaps the most interesting finding was that some parents described their children as not having a sense of humor or not being sensitive to others, and yet ranked those students as high in social skills. Such apparently contradictory findings provide evidence for the adaptability and heterogeneity of youth. Despite significant functional constraints, most of the students had one or more areas of strength and competence.

Exhibit 4-15
STUDENT STRENGTHS, BY SOCIAL SKILLS

Students Reported to Have Strength	Percentage with Overall Social Skills Rating			Sample Size
	High	Medium	Low	
Sense of humor				
Yes	21.6 (1.0)	69.0 (1.2)	9.3 (.7)	1,099
No	4.2 (1.6)	54.9 (3.9)	40.9 (3.9)	8,324
Sensitivity to others' feelings				
Yes	23.0 (1.1)	69.1 (1.2)	8.0 (.7)	7,326
No	4.9 (1.3)	60.3 (2.9)	34.8 (2.8)	2,041
Computer use				
Yes	21.8 (1.1)	67.1 (1.3)	11.1 (.9)	6,898
No	12.9 (1.8)	69.1 (2.4)	18.0 (2.0)	2,215
Athletic ability				
Yes	23.5 (1.3)	67.9 (1.4)	8.6 (.8)	5,122
No	12.3 (1.3)	67.5 (1.9)	20.2 (1.6)	4,201
Mechanical ability				
Yes	23.3 (1.3)	67.0 (1.5)	9.7 (.9)	4,802
No	14.5 (1.4)	69.0 (1.8)	16.5 (1.4)	4,507
Creative/artistic ability				
Yes	23.6 (1.3)	66.4 (1.5)	10.1 (1.0)	4,933
No	14.3 (1.3)	70.1 (1.7)	15.6 (1.4)	4,444
Performing arts				
Yes	22.9 (1.4)	67.5 (1.5)	9.7 (1.0)	4,870
No	15.5 (1.3)	68.2 (1.7)	16.3 (1.3)	4,421
Organizational skills				
Yes	27.5 (1.7)	66.3 (1.8)	6.2 (.9)	3,731
No	14.1 (1.1)	68.7 (1.5)	17.2 (1.2)	5,640

Standard errors are in parentheses.

Disability Differences in Student Strengths

There was a dramatic range in students' aptitudes among those with different primary disability classifications (Exhibit 4-16). Overall, students with speech/ language or hearing impairments were among the most likely to be reported to be strong in each of the areas, as were those with learning disabilities to a somewhat lesser extent. Students with autism, traumatic brain injury, multiple disabilities, or deaf-blindness were more likely to be rated lower by their parents/guardians.

In most disability categories, students scored higher in the two personality traits than in the specific skill areas. More than 90% of students with speech impairments were described as having a good sense of humor and sensitivity to others' feelings, as were more than 80% of students with learning disabilities or with hearing, visual, orthopedic, or other health impairments. The differences between the percentages of students with each of these traits in these categories were less than 10 percentage points, indicating a consistency in student's aptitudes. Interestingly, a high percentage of students with emotional disturbances (83%) were described as having a good sense of humor, but a much lower percentage (66%) were described as being sensitive to others' feelings.

Exhibit 4-16
PARENTS' REPORTS OF STUDENTS' STRENGTHS, BY DISABILITY CATEGORY

	Learning Disability	Speech/ Language Impairment	Mental Retardation	Emotional Disturbance	Hearing Impair- ment	Visual Impair- ment	Orthopedic Impairment	Other Health Impairment	Autism	Traumatic Brain Injury	Multiple Disabilities	Deaf- Blindness
Percentage with reported strength in:												
Sense of humor	91.5 (1.2)	93.9 (1.1)	86.8 (1.6)	83.1 (1.8)	91.1 (1.6)	91.2 (1.7)	94.3 (1.2)	90.1 (1.5)	76.0 (2.3)	88 (3.2)	85.8 (1.9)	87.6 (11.9)
Sensitivity to others' feelings	84.6 (1.5)	90.6 (1.4)	78.1 (2.0)	65.6 (2.2)	84.3 (2.0)	83.2 (2.3)	85.0 (1.9)	82.5 (1.9)	56.9 (2.7)	74.7 (4.3)	75.9 (2.4)	76.4 (15.2)
Computer skills	80.7 (1.7)	85.6 (1.7)	64.8 (2.3)	83.2 (1.8)	85 (2.0)	69.4 (2.9)	78.9 (2.2)	77.9 (2.3)	77.0 (2.3)	66.7 (4.8)	61.4 (2.7)	62.6 (17.2)
Athletic ability	73.4 (1.9)	76.6 (2.0)	50.8 (2.4)	66.7 (2.2)	70.5 (2.5)	47.3 (3.1)	31.7 (2.5)	58.0 (2.5)	37.6 (2.6)	46.5 (5.0)	44.5 (2.7)	31.9 (17.1)
Mechanical ability	64.9 (2.1)	68.2 (2.1)	41.9 (2.3)	70.1 (2.2)	61.1 (2.7)	40.8 (3.1)	37.3 (2.6)	55.4 (2.5)	43.5 (2.7)	38.5 (4.8)	38.9 (2.7)	34.7 (17.1)
Creative/artistic ability	61.6 (2.1)	67.9 (2.2)	41.0 (2.3)	63.6 (2.3)	65.6 (2.6)	50.4 (3.1)	47.2 (2.7)	52.9 (2.5)	38.6 (2.6)	47.4 (4.9)	41.4 (2.7)	15.9 (13.2)
Performing arts	58.1 (2.1)	60.9 (2.3)	53.5 (2.4)	53.0 (2.4)	54.1 (2.8)	65.3 (2.9)	48.8 (2.7)	48.9 (2.5)	43.8 (2.7)	46.0 (5.0)	50.2 (2.8)	37.6 (17.2)
Organizational ability	42.2 (2.1)	51.1 (2.4)	38.7 (2.3)	31.1 (2.2)	50.9 (2.8)	45.1 (3.1)	40.3 (2.6)	25.8 (2.2)	33.0 (2.5)	37.1 (4.8)	39.7 (2.7)	40.2 (18.3)
Sample size	1,009	816	827	850	1,001	781	947	916	1,086	348	787	41

Standard errors are in parentheses.

There was considerable variability between groups of students with different types of disabilities in reported strengths in specific skill areas (computer, athletic, mechanical, artistic, performing, and organizational skills). More than half of those with speech or hearing impairments were reported to have strengths in these areas. Ratings for these two groups ranged from a low of 51% with organizational skills to a high of 86% with computer skills. More than half of students with learning disabilities or emotional disturbances were reported as having strengths in each specific skill, except organizational skills. Students with visual impairments were reported to be strong in personality traits but scored lower regarding mechanical and athletic abilities. According to parents, fewer than 50% of students with mental retardation, orthopedic impairments, autism, traumatic brain injury, multiple disabilities, or deaf-blindness had strengths in most of the skill areas, except computer skills.

Demographic Differences in Student Strengths

Exhibit 4-17 depicts the variations in parents' reports of students' strengths for students who differed in age, gender, household income, and racial/ethnic background. Somewhat surprisingly, there were no differences among age groups in parents' reports of students' strengths. Although some skills were reported somewhat more frequently for older youth (i.e., computer skills and athletic abilities), others were reported less often for older than younger students (i.e., sensitivity to feelings and performing arts abilities), but no differences reached statistical significance because of the small number of older students.

Parents' reports indicated that boys and girls did not differ in the personality traits of having a sense of humor or being sensitive to other people's feelings, nor in an aptitude for computers. However, boys and girls differed significantly on all other abilities. Parents reported that girls were much more likely than boys to have particular strengths in the performing arts (72% vs. 50%; $p < .001$), organizational skills (48% vs. 40%; $p < .01$), and creative and artistic abilities (64% vs. 59%; $p < .05$). On the other hand, boys were more likely than girls to be reported as having athletic skills (72% vs. 64%; $p < .001$) and mechanical ability (72% vs. 42%; $p < .001$).

There were few notable differences between students of households with different income levels. Regardless of income, the majority of parents scored their children similarly in all skill categories, excluding organizational skills. Interestingly, students who lived in households with higher incomes scored lowest, with only about 40% being reported as good at this skill. Those whose family incomes were \$25,000 or less scored higher, with 48% ($p < .01$).

There were differences between students with different races/ethnicities in the personality traits. Hispanic (87%), white (85%) and Asian (84%) students with disabilities were significantly more likely to be reported as being sensitive to others' feelings than African American children (78%; $p < .01$). White children also were more likely to be reported as having a sense of humor than Hispanic and African American children (93% vs. 88%; $p < .01$).

In contrast, students who were African American or Hispanic were reported by their parents to be stronger than white students in both the performing arts (66% and 65% vs. 53% for white students; $p < .001$) and athletic ability (74% and 75% vs. 67% for white students; $p < .05$). African American and Hispanic students also scored higher than white students on organizational skills (51% and 53% vs. 38%; $p < .001$). Hispanic (86%) and white (81%) students were reportedly stronger in computer use than African American and Asian/Pacific Islander students (75%; $p < .01$ and $p < .05$, respectively).

Exhibit 4-17
DEMOGRAPHIC DIFFERENCES IN PARENTS' REPORTS OF STUDENTS' STRENGTHS

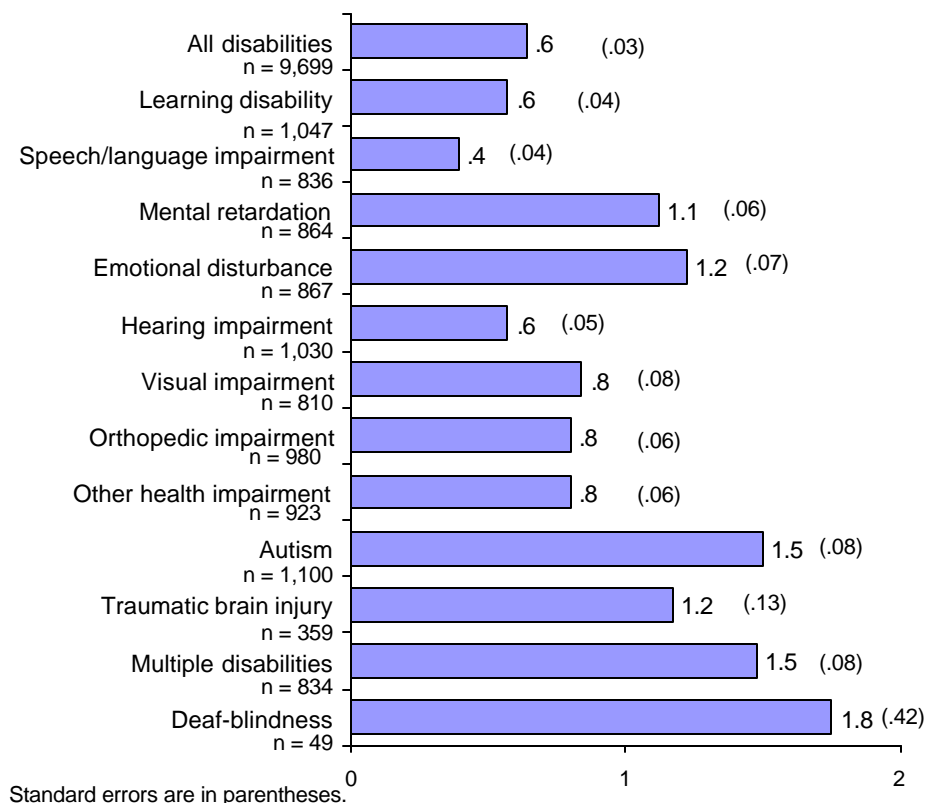
Students' Demographic Characteristics	Percentage Reported to Have Strength								Sample Size
	Sense of Humor	Sensitive to Others' Feelings	Com - puter Skills	Athletic Ability	Mech- anical Ability	Creative/ Artistic Ability	Perform - ing Arts	Organi- zational Ability	
Age									
6 to 9	91.2 (1.0)	85.2 (1.2)	80.7 (1.4)	69.7 (1.6)	62.8 (1.7)	61.2 (1.7)	58.3 (1.7)	44.5 (1.7)	4,678
10 to 12	91.0 (1.0)	83.5 (1.3)	79.9 (1.4)	69.1 (1.6)	62.4 (1.7)	59.8 (1.7)	57.0 (1.7)	42.0 (1.7)	4,207
13 or more	88.5 (4.6)	80.0 (5.8)	87.6 (4.9)	74.0 (6.3)	55.7 (7.2)	64.1 (7.0)	46.1 (7.3)	44.8 (7.2)	280
Gender									
Boys	91.3 (.8)	83.7 (1.1)	81.4 (1.2)	72.5 (1.3)	72.5 (1.3)	59.0 (1.5)	49.9 (1.5)	40.5 (1.5)	5,988
Girls	90.7 (1.2)	85.5 (1.5)	78.2 (1.8)	64.1 (2.0)	42.3 (2.1)	64.3 (2.0)	71.5 (1.9)	48.4 (2.1)	3,075
Household income									
\$25,000 or less	88.6 (1.3)	80.6 (1.6)	80.2 (1.7)	68.9 (1.9)	61.6 (2.0)	60.2 (2.0)	58.8 (2.0)	47.6 (2.0)	3,211
\$25,001 to \$50,000	92.3 (1.2)	86.7 (1.6)	79.3 (1.9)	70.4 (2.1)	63.5 (2.2)	62.1 (2.2)	57.9 (2.3)	39.0 (2.3)	2,366
More than \$50,000	93.3 (1.1)	88.4 (1.4)	81.7 (1.7)	68.8 (2.1)	61.9 (2.2)	59.1 (2.2)	53.6 (2.3)	40.2 (2.2)	2,920
Race/Ethnicity									
White	92.7 (.8)	85.3 (1.0)	80.9 (1.2)	67.1 (1.4)	63.2 (1.4)	60.8 (1.4)	52.9 (1.5)	38.4 (1.5)	5,797
African American	87.8 (1.8)	78.1 (2.3)	75.5 (2.5)	74.3 (2.5)	57.7 (2.8)	58.8 (2.8)	66.4 (2.6)	50.8 (2.8)	1,885
Hispanic	88.4 (2.4)	86.9 (2.5)	86.5 (2.6)	74.6 (3.2)	63.1 (3.5)	61.9 (3.6)	64.9 (3.5)	53.3 (3.7)	1,140
Asian/Pacific Islander	84.8 (8.2)	83.7 (8.4)	74.7 (9.9)	59.6 (10.9)	68.5 (10.7)	62.4 (10.9)	53.8 (11.0)	62.6 (10.7)	191
American Indian/ Alaska Native	95.0 (6.7)	70.3 (14.6)	96.9 (5.5)	75.0 (13.3)	85.7 (11.1)	55.0 (15.4)	66.3 (14.5)	21.1 (13.2)	56

Standard errors are in parentheses.

The Combination of Daily Living and Social Skills

As we discussed in the previous chapter, student problems and strengths in the daily living and social domains interact with each other and with challenges and strengths in other domains to shape “what the student brings to the table.” Exhibit 4-18 depicts the average number of limitations or problems reported in self care, functional mental skills, and social skills. In general, problems in these domains were somewhat less common than in the physical, sensory, and communication domains discussed in Chapter 3. As a whole, students with disabilities averaged fewer than one reported problem across these three domains. This finding varied considerably by disability category and resembles the pattern for the physical/sensory/communication domains. Students with deaf-blindness, multiple disabilities, or autism averaged the greatest number of problems. Students with speech impairments, learning disabilities, or hearing impairments were reported to have the fewest of problems across these domains. Students with emotional disturbances had greater difficulties in the social domains than in the other domains. This illustrates both that very few students with disabilities presented problems in only a single domain, and that the number and combination of domains affected varies widely.

Exhibit 4-18
AVERAGE NUMBER OF PROBLEMS IN DAILY
LIVING SKILLS ACROSS SOCIAL DOMAINS,
BY DISABILITY CATEGORY



Summary and Conclusions

Daily living skills set the stage for subsequent performance in school and independent living. Most students with disabilities were able to perform the tasks that were fundamental to self-care. The vast majority could feed and dress themselves. Functional mental skills presented significantly greater challenges; 25% performed tasks like counting change and reading common signs “very well,” leaving the majority with some degree of reported difficulty in carrying out these kinds of tasks. More than 60% rarely or never did the household chores we investigated.

Importantly, the competence and independence of older children were significantly higher than those of younger children, demonstrating the developmental nature of the skill areas reported here. Thus, we can expect to see students continue to build these competencies as they age.

There were significant differences in parents’ perceptions of students’ daily living skills, social abilities, and strengths. Disability classification clearly differentiated among students, with some disability groups demonstrating significant limitations, but often in different areas. For example, self-care skills were particularly challenging for students with orthopedic or visual impairments, whereas functional mental skills were particular limitations for students with autism or mental retardation. Even in the social arena, limitations were apparent in different domains for different categories of students. For example, those with emotional disturbances were quite socially engaged but were reported to have poorer skills in demonstrating cooperation and self-control.

Students also were distinguished markedly by gender, income, and race/ethnicity. For example, boys were significantly less likely to take on household responsibilities and were more likely to be reported as having athletic and mechanical abilities than girls, who were more likely to excel at the performing arts. Low-income students were reported to have greater limitations in functional mental skills, and African American students were less likely to be reported as being particularly sensitive to others’ feelings than other students.

These findings confirm that students with disabilities are a heterogeneous group, with a range of competencies and limitations. Strengths and weaknesses often varied among individuals in ways that were unpredictable and perhaps easily overlooked.

Although students with disabilities did not receive high marks for taking on household responsibilities, this fact may not be disability-related for some students. Students may have found it difficult to do laundry because of their disabilities, or they may have lacked a strong intrinsic motivation to do laundry. In other words, many of the findings reported here parallel what we would expect to find in the general student population. The impact of disabilities always must be interpreted in keeping with the principle that children will be children. Regardless of disability, children experience similar developmental processes and respond to them in similar ways.

There is ongoing discussion in the education literature concerning the model for functional behavioral assessments and the appropriate methods and goals of behavioral intervention plans (Miller et al., 1998; Quinn, Gable, Rutherford, Nelson, & Howell, 1998). Behaviors are complicated phenomena, and the failure of one-size-fits-all interventions attests to the limitations of broad-based behavioral modifications. In recent years, new methods have been developed for identifying configurations or patterns of individual functioning. These “person-oriented” or

“pattern-oriented” analyses are designed to account for heterogeneity among persons and to denote subsets of individuals who appear to share similar developmental pathways (Bergman, 1998; Bergman & Magnusson, 1997; Block, 1971). Such models might be used to better inform the assessment/intervention process, and identify potential windows of opportunity for change.

In sum, long-term success in education and employment is strongly linked to assertion, self-control, and cooperation, the social factors examined here. Although some students with disabilities had limitations that precluded all but the most basic social interactions, the vast majority were able to have complex and context-specific interchanges with others. Because social development is an interaction of multiple factors (e.g., changing contexts, situational constraints, accumulated experience, and individual characteristics), it should be possible for these students to continue to make gains in social competence throughout their lives.

5. A HOLISTIC VIEW OF STUDENTS WITH DISABILITIES

By Mary Wagner and Jose Blackorby

In this report, we have attempted to create a solid foundation for interpreting future results emerging from SEELS by painting a functional profile of elementary and middle school students who were receiving special education. We have documented functional abilities in several domains for students with disabilities as a whole and, importantly, for those who differed in primary disability classification, age, gender, economic status, and race/ethnicity. In doing so, important insights have emerged regarding each of those distinguishing features of students, as described below.

Disabilities: Powerful Distinctions, Multiple Dimensions

This initial look at the characteristics of elementary and middle school students receiving special education underscores the dramatic differences between students with different kinds of disabilities. For every characteristic of students and households considered here, greater differences were noted between students with different primary disability classifications than between students who differed in age, gender, or other characteristics. This fact reminds us of the limitations in what we can understand about students with disabilities when we focus on them as a single group; only when we take into account the important influences of disability differences on students' experiences do we truly begin to understand them.

But no matter how useful disability classifications are in summarizing important distinctions between students and their experiences, they also can mask a great deal about the abilities and inabilities of the students who share a given disability classification. Parents' reports of students' disabilities and functioning demonstrate clearly that the multiple dimensions of disability include but go beyond the designation for which students receive special education. For example, students within the primary disability classification of speech/language impairment all shared some limitation in that functional domain. However, their range of functioning was quite broad; 60% were reported to speak normally, whereas 7% had significant speech limitations or did not speak at all. And their speaking ability was not their only limitation; for example, 12% had some reported physical limitations and 9% were reported to have a hearing loss.

The range of severity of a given disability helps explain the variation in functioning of students who shared a primary disability classification. Among students with speech/language impairments as their primary disability, for example, parents reported that 9% had a hearing loss; 20% had visual limitations that required correction; 12% had limitations in the use of their arms, hands, legs, or feet; and 6% were in only fair or poor health. Parents reported that 13% could not take care of their self-care needs "very well" without help, two-thirds were not able to perform functional mental skills "very well," and the social skills of 7% were rated as low. The range of additional functional limitations illustrated by students with speech/language impairments was characteristic of every other disability category as well.

Clearly, students with this broad range of functional limitations faced more than the challenges suggested by their primary disability, and these challenges may have required that their schools take more comprehensive educational and service approaches than the students'

primary disability classification implied. As we delve further into the rich information available through SEELS, we will explore the educational programs and services students experienced and the performance they achieved; we will pay special attention to how these varied for students with different disabilities and for those who shared a disability classification, but differed in other important ways.

Age and Children's Development

These early analyses from SEELS have demonstrated the developmental nature of some kinds of disabilities and functional skills. For example, we have confirmed that speech and language disabilities emerged early in children's lives; they were the most prominent kind of developmental delay among infants and toddlers with disabilities (Hebbeler et al., 2001) and were the primary disabilities of almost half of students with disabilities between the ages of 6 and 9 (Wagner, 2002). However, among those ages 10 to 12, learning disabilities had eclipsed the role of the predominant disability. Speech/language impairment was the primary disability of only about one in five students in that age range.

Some functional abilities of students also reflected the importance of continued development as children aged. For example, the ability to speak clearly was significantly higher for older than younger students. In contrast, the ability to see normally was significantly less common among older than younger students. The ability of students to take care of their self-care needs; to perform daily cognitive tasks, such as telling time and counting change; and to take on household chores were rated more highly by parents of older than younger students—clear indications of increasing competence and independence. However, parents' ratings of students' social skills were somewhat lower for older than younger students.

These apparent age-related differences in some aspects of student functioning point up an interrelatedness of age and disability that was apparent in the shifting distribution of disabilities across the age cohorts. For example, the higher prevalence of normal speaking ability among older children may truly reflect positive development, in that younger children with delays in speech development tended to “catch up” with their peers and be declassified from special education, resulting in many fewer students with speech impairments in the older age groups. The apparently lower social skills of older students may reflect the significantly greater proportions of students with autism and emotional disturbances among older students; students in categories of disability were rated significantly lower in social skills than those with speech/language impairments, who were prominent among younger students.

Thus, it is difficult to conclude very much about the effects of aging on student functioning by comparing students in different age cohorts. Fortunately, the longitudinal design of SEELS enables us to explore the impact of age more accurately by watching each group of students as they develop and their functioning changes (or doesn't) with age. It is this change or stability in functioning, and its implications for student performance at home, in the community, and at school, that will command much attention as analyses of subsequent waves of SEELS data unfold.

The Limited Influence of Gender on Student Functioning

SEELS analyses have documented important gender differences in the rate at which students were identified for special education; but gender did not distinguish students in most aspects of functioning.

Boys accounted for more than half of the students in every disability category, despite being only about half of the students enrolled in schools. This disproportionate representation of boys among children with disabilities started early; a national study shows that even among infants and toddlers with disabilities, boys were 61% of those identified as needing early intervention services (Hebbeler et al., 2001).

The predominance of boys among students with disabilities was most pronounced among students with autism and emotional disturbances, 80% or more of whom were boys. But even among students with learning disabilities, speech/language impairments, and multiple disabilities, about two-thirds of students were boys. These findings suggest that something more than the perspective or discretion of educators or other service providers was in effect in generating the higher proportion of boys among students receiving special education.

Despite the influence of gender on the rates at which students were identified as needing special education for their disabilities, the functional abilities of students who were receiving special education were largely the same for boys and girls. There were no meaningful or significant differences between genders in their general health, physical functioning, or abilities to hear and communicate. The only difference noted was in the prevalence of normal vision, which favored boys. There also were no significant differences in boys' and girls' self-care abilities, functional mental skills, and social skills, as reported by parents.

However, gender differences did stand out in areas in which differences in social, cultural, and familial values, norms, and expectations can shape children's activities and preferences. For example, girls were much more likely than boys to do a specified set of household chores frequently, reflecting the more traditional female role. The areas of strength that were reported by parents for their children also were markedly different for boys and girls. Whereas boys were reported to excel in athletic and mechanical abilities, girls were much more likely to be reported as having aptitude for the performing arts and to have strong organizational skills.

As SEELS analyses continue to unfold, it will be interesting to see whether the similarities between boys and girls in the factors reported here also hold in other domains of students' lives. We will explore, for example, whether the very similar functional abilities of boys and girls translate into similar programs, treatment, and performance at school. As students age, data from subsequent waves of SEELS will enable an investigation of whether gender differences appear in such areas as social activities and course-taking.

The Pervasive Influence of Poverty

Students with disabilities were disproportionately poor, relative to students in the general population. In part, this situation occurs because factors that are associated with poverty actually create or contribute to disabilities of many kinds. Poor prenatal care or drug or alcoholic exposure during pregnancy can result in premature births, birth complications, or a variety of disabilities that may appear at birth or emerge later. Poor health care can result in untreated medical conditions that eventually may lead to or complicate disabilities, as in the case of

frequent and untreated ear infections that can lead to hearing loss. Exposure to lead paint in run-down housing can result in mental retardation in children. The stresses of poverty can contribute to poor family functioning, which, in turn, can be detrimental to children's cognitive, social, and emotional development (Duncan & Brooks-Gunn, 1997; Lewit, Terman, & Behrman, 1997).

The negative developmental impacts of poverty were clear among elementary and middle school students with disabilities. Poorer students with disabilities were significantly more likely than others to have limitations in each functional domain reported here. They were more likely to be in poor health; to have trouble with their arms, hands, legs, or feet; to have less-than-normal vision and hearing; and to have functional limitations in speaking, conversing, and understanding language. Those who had problems with vision or hearing were less likely than others to use a device to help correct those limitations. Parents of students from poorer households also were more likely than others to report that students had trouble feeding and dressing themselves independently, performing functional mental skills, and interacting with others socially. Despite this higher prevalence of limitations, poor students were more likely than their wealthier peers to be responsible for household chores, such as doing laundry and making their own breakfast or lunch, perhaps reflecting the smaller number of adults in households of poor students.

The prevalence of poverty and the conditions that accompany it are particularly troublesome in that research has demonstrated that the negative effects of poverty are particularly pronounced when children are young. Further, research has shown that its negative effects are cumulative and become more pronounced the longer children remain in poverty (Corcoran & Chaudry, 1997; Case, Lubotsky, & Paxson, 2001). Although the households of some students with disabilities who were poor in this initial SEELS wave will rise from poverty as children grow up, others are likely to remain poor. Subsequent waves of SEELS analyses will continue to track the achievements of students with disabilities, their economic status, and the relationships between them.

The Complexity of Racial/Ethnic Differences

Minority status and poverty were intertwined among students with disabilities. The parental and household characteristics that accompanied poverty, such as single-parent households and less well-educated parents, were more prevalent among African American and Hispanic students than among white or Asian/Pacific Islander students (Wagner, Marder, and Blackorby, 2002). The negative consequences of poverty that were highlighted above as more common for poorer students with disabilities also were more common for African American and, usually to a lesser extent, Hispanic students with disabilities.

Whatever the combination of cultural differences or poverty that come into play, significant differences were noted for different racial/ethnic groups in the factors addressed in this report, particularly with regard to African American students. Relative to white students, for example, they were less likely to be reported by parents as being in excellent or very good health, to understand others in conversation as well as other children, to have high functional mental skills or high social skills, or to be sensitive to others' feelings. They were more likely to have a reported hearing loss but less likely to use a hearing device to correct it. They also were more likely to be reported as having a high level of household responsibilities, perhaps because their

households, on average, had significantly fewer adults and more children than other households (Wagner, Marder, and Blackorby, 2002).

As we look to future SEELS analyses, we will be attentive to implications of differences in students' racial/ethnic backgrounds as they become apparent in their activities outside of school and in their experiences and achievements in school. In particular, we will continue to attempt to disentangle the commingled influences of income, ethnicity, and disability as they affect students in transition from their elementary to middle and middle to high school careers.

A Mosaic of Challenges and Strengths

A primary intent of this report was to look beyond students' primary disability classifications and paint a more comprehensive picture of the multiple factors that influence their development and their ability to succeed in school. SEELS data depict a population that was extremely diverse. They varied in their disabilities, ages, genders, economic statuses, racial/ethnic backgrounds, abilities, limitations, and unique attributes. Each of these is likely to exert important and independent influences on their experiences and achievements in and out of school. Students with disabilities also varied dramatically in the ways that these characteristics aggregated and interacted with one another. For example, most students with disabilities faced challenges to functioning in more than a single domain, and some students had limitations in as many as seven functional domains. Most common were problems in domains related to communication, including conversing, speaking, and understanding others. This cluster of problems is likely to present challenges in learning tasks, socialization, and overall functioning. Still, even within a broad domain such as communication, there was diversity. The positive relationship between conversing and understanding illustrates that many students had difficulties in both areas. Many also had trouble in only one.

An important addition to this equation is the nature of students' strengths and unique abilities. Virtually all students with disabilities had a reported strength in one or more areas, but they were not always directly linked to classroom activities. For many students, the total number of strengths was greater than the number of reported challenge areas. For others, the reverse was true. Whatever the extent to which educational strategies build on student strengths, students were bringing much to the table.

This diversity of challenges and strengths pushes our thinking about both effective programming and the nature of results students will achieve. Given the great range in student functioning, educational programs will need to be carefully tailored to meet those needs. Indeed, these findings reaffirm the original cornerstones of IDEA and special education values and practice generally—students are entitled to an individualized education program that is designed specifically to meet their needs. This principle of individualized education remains as powerful today as it was in 1975.

As additional SEELS data become available, we will learn about schools' efforts to meet the diverse needs of students in terms of overall educational goals, curricula, placements, instruction, and services. SEELS data also will shed light on the results these students will achieve in a broad range of outcome areas, including academics, social adjustment, and community participation. The longitudinal design of SEELS allows us to assess how student characteristics, service strategies, and outcomes unfold over a period of years as students move into the challenges that face them in adolescence and secondary school.

REFERENCES

- Benson, V. & Marano, M. A. (1994). Current estimates from the National Health Interview Survey, 1993. National Center for Health Statistics. *Vital and Health Statistics*, 10(190). Hyattsville, MD: Department of Health and Human Services, Public Health Service Publication No. 95-1518.
- Bergman, L. R. (1998). A pattern-oriented approach to studying individual development: Snapshots and processes. In R. B. Cairns, L. R. Bergman, & J. Kagan (Eds.), *Methods and models for studying the individual*. Thousand Oaks, CA: Sage.
- Bergman, L. R., & Magnusson, D. (1997). A person-oriented approach in research on developmental psychopathology. *Developmental Psychopathology*, 9, 291-319.
- Berndt, T. J., & Savin-Williams, R. C. (1993). Peer relations and friendships. In P. H. Tolan & B. J. Cohler (Eds.), *Handbook of clinical research and practice with adolescents*. New York: Wiley.
- Bilken, D. (1992). *Schools without labels*. Philadelphia: Temple University Press.
- Block, J. (1971). *Lives through time*. Berkeley, CA: Bancroft.
- Cairns, R. B. (1979). *Social development: The origins and plasticity of interchanges*. San Francisco: Freeman.
- Cairns, R. B., & Cairns, B. D. (1994). *Lifelines and risks: Pathways of youth in our time*. Cambridge, England: Cambridge University Press.
- Christensen, C. A. (1997). Competing notions of social justice and contradictions in special education reform. *The Journal of Special Education*, 31(2), 191-198.
- Christiansen, J. B., & Leigh, I. W. (2001). *Cochlear implants in children: ethics and choices*. Washington, DC: Gallaudet University Press.
- Coie, J. D. (1990). Toward a theory of peer rejection. In S. R. Asher & J. D. Coie (Eds.), *Peer Rejection in Childhood* (pp. 365-399). New York: Cambridge University Press.
- Cuban, L. (1996). Myths about changing schools and the case of special education. *Remedial and Special Education*, 17(2), 75-82.
- Dodge, K. A. (1990). Peer status and aggression in boys' groups: Developmental and contextual analyses. *Child Development*, 61, 1289-1309.
- Duncan, G. J., & Brooks-Gunn, J. (1997). *Consequences of growing up poor*. New York: Russell Sage Foundation.
- Farmer, T. W., & Cadwallader, T. W. (2000). Social interactions and peer support for problem behavior. *Preventing School Failure*, 44, 105-109.

- Farmer, T. W., & Farmer, E. M. Z. (1996). The social relationships of students with exceptionalities in mainstream classrooms: Social networks and homophily. *Exceptional Children*, 57, 117-126.
- Federal Interagency Forum on Child and Family Statistics. (2001). *America's children: Key indicators of well-being, 2001*. Washington, DC: author.
- Fuchs, D., and Fuchs, L. S. (1994). Inclusive schools movement and the radicalization of special education reform. *Exceptional Children*, 60, 294-309.
- Fuchs, D., and Fuchs, L. S. (1995). What's special about special education? *Phi Delta Kappan*, 76, 522-530.
- Gallaudet Research Institute. (January, 2001). *Regional and national summary report of data from the 1999-2000 annual Survey of Deaf and Hard of Hearing Children and Youth*. Washington, DC: Gallaudet University.
- Gartner, A., and Lipsky, D. K. (1987). Beyond special education: Toward a quality system for all students. *Harvard Educational Review*, 57, 367-395.
- Gersten, R., Vaughn, S., Deshler, D., and Schiller, E. (1997). What we know about using research findings: Implications for improving special education practice. *Journal of Learning Disabilities*, 30(5), 466-476.
- Gresham, F. M., & Elliot, S. N. (1990). *Social Skills Rating System Manual*. Circle Pines, MN: American Guidance Service.
- Gresham, F. M., MacMillan, D. L., and Bocian, K. M. (1996). Learning disabilities, low achievement, and mild mental retardation: More alike than different? *Journal of Learning Disabilities*, 29(6), 570-581.
- Hebbeler, K., Wagner, M., Spiker, D., Scarborough, A., Simeonsson, R., & Collier, M. (2001). *A first look at the characteristics of children and families entering early intervention services*. Menlo Park, CA: SRI International.
- Holden-Pitt, L. (1997). *Who and where are our children with cochlear implants?* Paper presented at the convention of American Speech-Language-Hearing Association, Boston, MA.
- Jolivette, K., Scott, T. M., & Nelson, C. M. (2000, January). The link between functional behavioral assessments (FBAs) and behavioral intervention plans (BIPs). ERIC Digest E592. Available: http://www.ed.gov/databases/ERIC_Digests/ed438662.html.
- Kauffman, J. M. (1995). How we might achieve radical reform of special education.. *Exceptional Children*, 6, 6-16.
- Kauffman, J. M., and Lloyd, J. W. (1995). A sense of place: The importance of placement issues in contemporary special education. In J. M. Kauffman, J. W. Lloyd, D. P. Hallahan, and T. A. Astuto (Eds.), *Issues in educational placement: Students with emotional and behavioral disorders* (pp. 3-19). Hillsdale, NJ: Lawrence Erlbaum Associates.

- Kauffman, J. M., and Pullen, P. L. (1996). Eight myths about special education. *Focus on Exceptional Children*, 28(5), 1-12.
- Kavale, K. A. (1991). A critique of assessment methodology. In H.L. Swanson (Ed.), *Handbook on the assessment of learning disabilities*. Austin: Pro-Ed.
- Kavale, K., Fuchs, D., and Scruggs, T. (1994). Setting the record straight on learning disability and low achievement: Implications for policymaking. *Learning Disabilities Research and Practice*, 9, 70-77.
- Lewit, E. M., Terman, D. L., & Behrman, R. E. (1997). Children and poverty: Analysis and recommendations, *The Future of Children*, 7, 4-24.
- Loeber, R., & Hay, D. F. (1997). Key issues in the development of aggression and violence from childhood to early adulthood. *Annual Review of Psychology*, 48, 371-410.
- Loeber, R., & Stouthamer-Loeber, M. (1998). Development of juvenile aggression and violence: Some common misconceptions and controversies. *American Psychologist*, 53, 242-259.
- Lovitt, T. (1993). Recurring issues in special and general education. In J. L. Goodlad and T. Lovitt (Eds.), *Integrating general and special education* (pp. 49-71). New York: MacMillan.
- Lyons, J. (1999). A call for outcomes data: Psychopharmacology with children. *Outcomes and Accountability Alert*, 12.
- Magnusson, D., & Bergman, L. R. (1990). A pattern approach to the study of pathways from childhood to adulthood. In L. N. Robins & M. Rutter (Eds.), *Straight and devious pathways from childhood to adulthood* (pp. 101-115). Cambridge, UK: Cambridge University Press.
- Moore, D. F. (1987). *Educating the deaf*. New York: Houghton-Mifflin.
- Mercer, J.R. (1992). The impact of changing paradigms of disability on mental retardation in the year 2000. In L. Rowitz (Ed.), *Mental retardation in the year 2000* (pp. 15-38). New York: Springer.
- Miller, J. A., Tansy, M., & Hughes, T. L. (1998, November 18). Functional behavioral assessment: The link between problem behavior and effective intervention in schools. *Current Issues in Education*, 1(5). Available at <http://cie.ed.asu.edu/volume1/number5/>.
- MTA Cooperative Group. (1999). A 14 month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Archives of General Psychiatry*, 56, 1073-1086.
- Nagin, D., & Tremblay, R. E. (1999). Trajectories of boys' physical aggression, opposition, and hyperactivity on the path to physically violent and nonviolent juvenile delinquency. *Child Development*, 70, 1181-1196.
- National Center for Health Statistics. (2001). *Disabilities and impairments*. Available at <http://www.cdc.gov/nchs/fastats/disable.htm>.

- National Center for Education Statistics. (2000) *Digest of education statistics, 1999*. Available at <http://nces.ed.gov/pubs2000/digest99/d99t025.html>.
- Office of Special Education Programs. (2001). *Table AA6. Number of children served under IDEA, Part B by disability and age during the 1999-2000 school year*. Available at http://www.Ideadata.org/arc_toc.html#partbCC.
- Parker, J. G., & Asher, S. R. (1987). Peer relations and later personal adjustment: Are low-accepted children at risk? *Psychological Bulletin*, 102, 357-389.
- Quinn, M. M., Gable, R. A., Rutherford, R. B., Nelson, C. M., & Howell, K. W. (1998). *Addressing student problem behavior: An IEP team's introduction to functional behavioral assessment and behavior intervention plans* (2nd Ed.). Washington, DC: The Center for Effective Collaboration and Practice.
- Robins, L. N., & Price, R. K. (1991). Adult disorders predicted by childhood conduct problems: Results from the NIMH Epidemiologic Catchment Area project. *Psychiatric Journal for the Study of Interpersonal Processes*, 54, 116-132.
- Robins, L. N., & Rutter, M. (Eds.). (1990). *Straight and devious pathways from childhood to adulthood*. Cambridge, UK: Cambridge University Press.
- Rodkin, P. C., Farmer, T. W., Pearl, R., & Van Acker, R. (2000). Heterogeneity of popular boys: Antisocial and prosocial configurations. *Developmental Psychology*, 36, 14-24.
- Roff, J. D., & Wirt, R. D. (1984). Childhood social adjustment, adolescent status, and young adult mental health. *American Journal of Orthopsychiatry*, 54, 595-602.
- Safer, D. J., & Malever, M. (2000). Stimulant treatment in Maryland public schools, *Pediatrics* 106(3), 533-539.
- Safer, D. J., Zito, J. M., & Fine, E. M. (1996). Increased methylphenidate usage for attention deficit disorder in the 1990s. *Pediatrics*, 98(6), 1084-88.
- Sandstrom, M. J., & Coie, J. D. (1999). A developmental perspective on peer rejection: Mechanisms of stability and change. *Child Development*, 70, 955-966.
- Skrtic, T.M. (1991). The special education paradox: equity as the way to excellence. *Harvard Educational Review*, 61, 148-206.
- Snyder, H. M., & Sickmund, N. (1999). *Juvenile offenders and victims: 1999 national report*. Washington, DC: Office of Juvenile Justice and Delinquency Prevention.
- Stanger, C., Achenbach, T. M., & Verhulst, F. C. (1997). Accelerated longitudinal comparisons of aggressive versus delinquent syndromes. *Development and Psychopathology*, 9, 43-58.
- Swanson, H. L. (1996). Classification and dynamic assessment of children with learning disabilities. *Focus on Exceptional Children*, 28(9), 1-20.

- U.S. Department of Education. (1997). *IDEA: An overview*. Available at <http://www.ed.gov/offices/OSERS/IDEA/overview.html>.
- Wagner, M. (2002). *Disability profiles of elementary and middle school students receiving special education*. Menlo Park, CA: SRI International.
- Wagner, M., Marder, C., & Blackorby, J. (2002). *The children we serve: The demographic characteristics of elementary and middle school students with disabilities*. Menlo Park, CA: SRI International
- Wagner, M., Newman, L., D'Amico, R., Jay, E. D., Butler-Nalin, P., Marder, C., & Cox, R. (1991). *Youth with disabilities: How are they doing?* Menlo Park, CA: SRI International.
- Wagner, M. (Ed.). (1993). *The secondary school programs of students with disabilities*. Menlo Park, CA: SRI International.
- Wagner, M., D'Amico, R., Marder, C., Newman, L., & Blackorby, J. (1992). *What happens next? Trends in postschool outcomes of youth with disabilities*. Menlo Park, CA: SRI International.
- Xie, H., Cairns, R. B., & Cairns, B. D. (1999). Social networks, and configurations in inner-city schools: Aggression, popularity, and implications for students with EBD. *Journal of Emotional and Behavioral Disorders*, 7, 147-155.
- Zito, J. M., Safer, D. J., dosReis, S., Gardner, J. F., Boles, M., & Lynch, F. (2000). Trends in the prescribing of psychotropic medications to preschoolers. *Journal of the American Medical Association*, 283(8): 1025-30.

Appendix

SEELS SAMPLING, DATA COLLECTION, AND ANALYSIS PROCEDURES: WAVE 1 PARENT INTERVIEW/SURVEY

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.¹³ These districts and 77 state-supported special schools that primarily serve 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 LEA¹⁴ 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 students samples are provided below.

¹³ The 1999 Quality Education Data, Inc. (QED) database was used to construct the sampling frame.

¹⁴ LEAs were instructed to include on the roster any student for which they were administratively responsible, even if the student was not educated within the LEA (e.g., attended school sponsored by an education cooperative or was sent by the LEA to a private school). Despite these instructions, some LEAs may have underreported students served outside the LEA.

The 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; 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. This was done to improve comparisons with the findings of other research and 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 associated with size 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 provided 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) were 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. The sample of LEAs was somewhat smaller than anticipated. However, 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 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

In determining the size of the SEELS student sample, we 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 traumatic brain injury 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.¹⁵ 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, we sampled 100% of students with deaf-blindness, 50% of students with visual impairments, and 15% of those with hearing impairments. 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/Survey

The data source for the findings reported here was parents/guardians of SEELS sample members, who were interviewed by telephone or surveyed by 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 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 survey period that extended from December 2000 through

¹⁵ 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

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.

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.

Weighting the Wave 1 Parent Data

In describing students with disabilities, we generally report percentages of students with a particular characteristic, status, or experience (e.g., the percentage of students living with a single parent or having moderate hearing loss). Percentages are weighted to represent the U.S.

population of students receiving special education who were ages 6 to 12 on September 1, 1999 and in at least first grade. They are not percentages of the sample, but estimates for the population of students with disabilities in the SEELS age range as a whole and for students in each of the federal special education disability categories in use in 1999. In other words, rather than each student counting equally in calculating percentages, each student's value for a variable is weighted proportionate to the number of students like him/her nationally. Hence, for example, values for students with learning disabilities are weighted more heavily than those for students with visual impairments when discussing students as a group because of the significantly greater number of students with learning disabilities in the population as a whole.

Exhibit A-2 illustrates the concept of sample weighting and its effect on percentages or means that are calculated for students with disabilities as a group. In this example, 10 students are included in a sample, 1 from each of 12 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 or speech impairment than orthopedic or other health impairments, for example. Therefore, in calculating a population estimate, we apply weights in the example 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 89%. 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-2).

Exhibit A-2
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)

Sample Weighting

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).

Bias

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 (295) violated the constraints, and therefore reduced these weights to a more reasonable value (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

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

where Neff is the effective sample size, $E^2[W]$ is the square of the arithmetic average of the weights and $V[W]$ is the variance of the weights. For a variable X, the standard error of estimate can typically be approximated by $\sqrt{V[X]/\text{Neff}}$, 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 an effective sample size standard error estimate that underestimated 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.

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 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.

Demographic characteristics. Findings in this report are provided for students who differ in age, gender, household income, and race/ethnicity. For the majority of students, age, gender, and race/ethnicity were determined from data provided by students' schools or districts for sampled students. For students for whom information was not provided by schools or districts, data for these variables were gathered during the parent interview. Classifying the household income of students' households relied exclusively on information provided during the parent interview/survey.

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.