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ABSTRACT

As part of the National Longitudinal Transition Study of Special Education Students (NLTS), this study examined characteristics of and educational programs and services provided to secondary students (N=589) classified as learning disabled (LD) in the 1985-86 school year. Difficulties in performing basic functional skills were identified in about half of the students. Average student IQ was 87. LD students were more likely than others to come from economically disadvantaged households. Students spent an average of 64% of instructional time in regular education classes suggesting that the regular education initiative has limited potential in increasing the mainstreaming of these students at the secondary level. Students were more likely to be mainstreamed for nonacademic or vocational courses than for academic classes. Most LD students were held to the same grading standard as nondisabled students in regular education classes, and generally were not provided direct services (beyond their special education classes) such as tutoring assistance. Neither were regular education teachers provided with substantial direct support for instruction of these students. Grade failure and subsequent dropping out were positively correlated with amount of time spent in regular education classes, independent of student ability level, IQ, or demographic characteristics. Contains 44 references. (DB)

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The American public education system is facing the challenge of serving an increasingly diverse student body. Demographic trends in the United States suggest that, more than ever before, the public school classroom is including more students from a wider range of ethnic backgrounds, from lower income households that even may be homeless, and from single-parent families (Hodgkinson, 1985; Yates, 1986). A current programmatic trend within special education, termed the "regular education initiative," is also increasing the diversity of students being served by the regular education system. This initiative encourages the education of the vast majority of students with disabilities in regular education classrooms with their nonhandicapped peers (Will, 1986; Gartner and Lipsky, 1987).

More than half of special education students are categorized as learning disabled. In the 1987-88 school year, there were more than 1.1 million such students in the secondary school age range and they constituted 56% of special education students 12 years old or older (U.S. Department of Education, 1989). These are the students most likely to be increasingly instructed in regular education classes in schools influenced by the regular education initiative. However, the policy debate about the appropriateness of regular education placements for students with learning disabilities goes on in the absence of some very basic information about these students' current involvement with regular education placements and their performance in those placements. Educators and policymakers have had little information about the educational programs and services students with learning disabilities actually received nationally or about how well students performed in those programs or in other aspects of their lives, both in and outside of school.

The National Longitudinal Transition Study of Special Education Students (NLTS) has compiled a database that is beginning to provide answers to questions about school programs, support services, and youth outcomes for students with disabilities. Conducted by SRI International for the Office of Special Education Programs (OSEP) of the U.S. Department of Education, this 5-year study includes a nationally representative sample of more than 8,000 youth who were ages 13 to 21 and secondary special education students in the 1985-86 school year. The sample represents youth in all 11 federal disability categories, including youth classified as learning disabled, and permits findings to be generalized nationally for each disability group. Information was collected in 1987 from telephone interviews with parents of youth in the study, from a survey of educators in the schools they attended, and from students' school records. (More information on the NLTS is contained in the appendix.)

This paper presents findings from the NLTS regarding youth who, in the 1985-86 school year, were classified as learning disabled by the school or school district from which they were selected. Three issues are addressed. First, the characteristics of students are described. It is important to understand the educational challenges students with learning disabilities present to their teachers and schools as a context for discussion of their educational placements. This is followed by a description of the educational programs and support services provided students classified as learning disabled during their most recent year in secondary school. To what extent were students with learning disabilities already receiving instruction in regular education classrooms? What help did they receive to succeed there? Finally, several aspects of students' secondary school performance are examined. How were they doing in school? What factors are associated with students who exhibited better school performance, as opposed to those receiving failing grades or, ultimately, dropping out of school? Answers to questions such as these provide an empirical backdrop for discussions among regular and special educators concerning how one subgroup of students they both serve, students classified as learning disabled, can best be helped to achieve success in their secondary school experiences.

Characteristics of Students Classified as Learning Disabled

Two characteristics of students classified as learning disabled have important implications for their future educational achievement: the learning obstacles posed by their disabilities, and the overrepresentation of students who are poor among those classified as learning disabled. The disability-related and demographic characteristics of students with learning disabilities are discussed below.

Disability-Related Characteristics of Students Classified as Learning Disabled

Although the term "learning disabled" refers to a single category of disability in federal education definitions and regulations, the disabilities included in that category vary widely in both nature and severity. Learning disabilities encompass minimal brain dysfunctions that "may manifest themselves in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations" (Section 602(15), P.L. 94-142). Students may be mildly impaired in any of these functions, or virtually unable to perform the activities involved. Hence, students classified as learning disabled are extremely heterogeneous and bring to the educational process widely varied abilities and disabilities that may be masked by a single label. No single educational approach can be successful in meeting the needs of students with such disparate profiles of abilities and disabilities.

Table 1* illustrates the range in some abilities represented by youth classified as learning disabled. The NLTS asked parents how well their children could perform four tasks that involved applying basic mental functions, such as reading and calculating, to everyday activities. The tasks included counting change, telling time on a clock with hands, looking up telephone numbers and using the phone, and reading common signs. Most youth in the general population have mastered these tasks by the ages of 15 to 23, the ages of NLTS students when parents assessed their abilities.

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* Percentages and means are weighted to represent students with learning disabilities nationally in the 1985-86 school year. Sample sizes (Ns) are unweighted and reflect the actual number of cases on which means and percentages are based.

Table 1
SELECTED FUNCTIONAL ABILITIES
OF SECONDARY STUDENTS CLASSIFIED AS LEARNING DISABLED

Parent-Reported Functional Abilities	Percentage	Standard Error
Youth reported by parent as able to read common signs:		
Very well	83.8	1.8
Pretty well	13.0	1.6
Not very well	2.7	.8
Not at all well	.4	.3
Youth reported by parents as able to tell time on a clock with hands:		
Very well	76.8	2.0
Pretty well	16.9	1.8
Not very well	5.3	1.1
Not at all well	1.0	.5
Youth reported by parents as able to count change:		
Very well	70.9	2.2
Pretty well	21.8	2.0
Not very well	5.7	1.1
Not at all well	1.6	.6
Youth reported by parents as able to look up telephone numbers and use the phone:		
Very well	62.3	2.3
Pretty well	27.2	2.1
Not very well	6.3	1.2
Not at all well	4.2	1.0
Youth reported by parents as able to perform all four tasks very well	46.0	2.4

Source: Parent interviews. N=511.

Although the majority of students classified as learning disabled were reported by parents to perform individual tasks very well without help, mastery of the tasks was hardly universal. Students' proficiency varied significantly among the tasks. Looking up telephone numbers and using the telephone was apparently the most problematic, with parents of 38% of youth reporting that their child had at least some trouble doing that task without help. Youth were reported to have least trouble with reading common signs; however, even there, 16% of parents reported youth had some difficulty with

that task. Overall, only 46% of youth classified as learning disabled were reported to be able to perform all four functional skills very well without help, indicating deficiencies in basic functional skills that were fairly pervasive. These skill deficiencies could be expected to put students with learning disabilities at a distinct disadvantage in confronting the academic expectations of junior and senior high school courses.

Further, there are indications that these educational deficits were not first experienced at the secondary school level. Almost 3 of 4 students (73%) classified as learning disabled were at least one year older than the typical age-for-grade, an indicator commonly used as a proxy measure of earlier grade retention (Shephard and Smith, 1989). Students who have experienced grade retention have been demonstrated to be at significantly greater risk for later academic failure and early school leaving (Bachman, Green, and Wirtenan, 1971; Zigmond and Thornton, 1985; Shephard and Smith, 1989).

Difficulties in performing basic functional skills and prior educational failure for some students may have resulted from specific learning dysfunctions. For other students classified as learning disabled, they may also be indicative of generally low-normal intelligence, as measured by IQ scores.* For still others, specific learning disabilities and low measured IQ scores may be related, in that learning disabilities may contribute to poor test performance, independent of actual intellectual potential.

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* IQ scores were missing for 16% of the students classified as learning disabled for whom school records were obtained. This rate of missing data raised the question of whether the IQ scores might be biased. Perhaps IQ tests were administered more often to students at the borderline of mental retardation, to determine proper classification; perhaps students who seemed to be of normal or above normal intelligence were tested less often, resulting in NLTS IQ scores being lower than would have occurred if scores had been uniformly available. However, parent reports of functional abilities of students with and without IQ scores were not significantly different. To the extent that parent reports of functional skills proxy for more general abilities, as indicated by IQ scores, the absence of a significant difference in parent reports suggests an absence of bias in the IQ data. IQ scores are also consistent with scores reported in both national and local studies of learning disabled students (Kirk and Elkins, 1975; Norman and Zigmond, 1980; Zigmond and Thornton, 1985).

Table 2
IQ SCORES* OF SECONDARY STUDENTS CLASSIFIED AS LEARNING DISABLED

Average IQ score	87
	(.7)
Percentage of students with IQ score of:	
70 or lower	6.5
	(1.3)
71 to 90	59.7
	(2.6)
91 to 110	28.8
	(2.4)
More than 110	4.9
	(.7)

Standard errors are in parentheses. Source: Students' school records. N=748.

Table 2 shows that, although the mean IQ score for students in the category was in the average range (87), 6% of students classified as learning disabled had IQ scores of 70 or below, the range that would qualify a student as mentally retarded in most states. The majority of students had IQ scores from 71 to 90 (60%), with fewer than one-third of students having IQ scores higher than 90.

Demographic Characteristics of Students Classified As Learning Disabled

The presence of learning problems is not the only factor that set students with learning disabilities apart from their nonhandicapped peers. As shown in Table 3, students classified as learning disabled were also significantly more likely than students in the general population to be male (73% vs. 51%), and they were more likely to evidence one or more of a set of demographic characteristics associated with economic disadvantage. They were more likely than the general student population to be Black and less likely to be living in a suburban community. Students classified as learning disabled were more likely than students as a whole to live in a household with a single parent, a parent with less than a high school education, a household income of less than $25,000 per year, and participation in the Food Stamp Program. For many years, research has demonstrated the association between poorer educational performance and these demographic characteristics.

Table 3

DEMOGRAPHIC CHARACTERISTICS OF SECONDARY STUDENTS CLASSIFIED AS LEARNING DISABLED AND THE GENERAL STUDENT POPULATION

Demographic Characteristics	Percentage of: Students Classified as Learning Disabled	Percentage of: General Student Population
Male	73.4 (1.9)	50.8[1]
N	1189	
Ethnicity		
Black	21.6 (1.9)	12.2[2]
White	67.2 (2.2)	70.0
Hispanic	8.4 (1.3)	12.6
Other	2.8 (.6)	5.2
N	994	
Attended school in area that was:		
Urban	28.2 (2.0)	27.4[1]
Suburban	35.8 (2.1)	49.0
Rural	36.1 (2.1)	23.6
N	1055	
Head of household not a high school graduate	37.8 (2.3)	22.3[1]
N	927	
Annual household income less than $25,000	65.4 (2.4)	38.8[1]
N	846	
From a single-parent household	34.3 (2.3)	25.6[1]
N	894	
From a household receiving Food Stamps	22.5 (2.0)	12.9[3]
N	919	

Standard errors are in parentheses.

1 U.S. Buearu of the Census, 1987a.

2 National Center for Education Statistics, 1987.

3 U.S. Department of Education, 1988.

Thus, as a group, students classified as learning disabled presented to the educational system the dual challenges of disability and economic disadvantage. By secondary school, poor functional skills and a history that may have encompassed little academic success combined to put many students at risk of failure in high school and in later life.

Educational Programs of Students Classified as Learning Disabled

The vast majority of students with learning disabilities attended comprehensive secondary schools; only about 2% attended special schools that served only students with disabilities. What educational programs were they provided in their secondary schools? This section describes the degree to which the instructional programs of students classified as learning disabled were integrated into the regular education system. It then examines the extent to which policies and programs in regular secondary schools accommodated the special needs of mainstreamed students with learning disabilities and the regular education teachers who taught them.

Instruction in Regular Education Classes

Although we think of students with learning disabilities as special education students, most of these students spent most of their time in regular education classes, with an average of 64% of instructional time spent in regular education, as shown in Table 4. This finding from the NLTS for a single school year is very similar to findings from the 1987 National High School Transcript Study that 68% of all course credits earned in four years in high school by students with disabilities were in regular education classes (U.S. Department of Education, 1990). NLTS data indicate that the average percentage of time in regular education classes was not significantly different for students at different grade levels. However, students not assigned to a grade level averaged significantly less regular education instruction (17% of their instructional time) than students at any specific grade level (58% to 68% of instructional time).

Table 4
REGULAR EDUCATION INSTRUCTION OF STUDENTS
CLASSIFIED AS LEARNING DISABLED WHO ATTENDED REGULAR SECONDARY SCHOOLS

Characteristics of Integration	Percentage	Standard Error	N
Mean percentage of instructional time spent in regular education classes by students with learning disabilities in:			
All secondary grades	63.8	1.6	824
Grades 7 or 8	58.5	4.9	80
Grades 9 or 10	64.4	2.5	287
Grade 11	67.9	2.8	179
Grade 12	67.3	2.9	251
Programs not assigned a grade level	16.9	7.4	22
Percentage of instructional time spent in regular education classes by students classified as learning disabled:			
0%	9.2	1.4	
1 to 25%	8.2	1.4	
26% to 50%	14.9	1.8	
51% to 75%	24.3	2.1	
76% to 99%	25.0	2.2	
100%	18.2	1.9	
N	824		

Source: Students' school records.

About 1 in 4 students classified as learning disabled spent between 51% and 75% of their instructional time in regular education classes, and the same proportion spent between 76% and 99% of their instructional time mainstreamed. Another 18% were mainstreamed for all courses. Despite their skill deficiencies and learning problems, the regular education classroom was considered the appropriate environment for most students with learning disabilities for most of their instructional time. These data confirm the contention of the U.S. Department of Education regarding "the compelling importance of regular education instructors in the secondary school preparation of students with handicaps" (U.S. Department of Education, 1990).

The extent to which students with learning disabilities were mainstreamed reflected in part the kinds of courses they took. Table 5 indicates that students were more likely to be mainstreamed for nonacademic or vocational courses than for academic classes. Almost 9 of 10 students

Table 5
PERCENTAGE OF STUDENTS CLASSIFIED AS LEARNING DISABLED WHO ATTENDED REGULAR SECONDARY SCHOOLS AND WERE ENROLLED IN REGULAR EDUCATION CLASSES, BY TYPE OF COURSE

Regular Education Placements	Percentage	Standard Error	N
Students taking nonacademic courses who took them in regular education classes	87.1	1.8	690
Students taking vocational courses who took them in regular education classes	84.8	2.0	657
Students taking academic courses who took them in regular education classes	70.1	2.3	803

Source: Students' school records.

classified as learning disabled took nonacademic classes, such as art, music, or physical education, and 87% of the students who took such courses were enrolled in regular education classes for them. About 64% of students with learning disabilities took vocational courses in their most recent school year; 85% of students who took vocational education courses took them in regular education settings. Virtually all students classified as learning disabled took academic courses, and 70% of those students took at least one of their academic courses in a regular education class. In fact, being mainstreamed for a majority of the school day essentially required that students be mainstreamed for at least some academic classes.

Lower rates of mainstreaming for academic classes may indicate the generally greater educational challenges presented by courses in mathematics, science, social studies, or language arts, than by nonacademic or vocational subjects. If so, we would expect that the more capable students in the learning disabled category would be those mainstreamed for academic courses. NLTS data confirm this expectation; students who were mainstreamed for most of their day and for academic classes were generally the more skilled of students classified as learning disabled. For example, 70% of students classified as learning disabled who were mainstreamed for academic courses were reported by parents to perform at least 3 of the 4 functional skills the NLTS investigated very well without help; among students mainstreamed for nonacademics only, 58% were reported to perform at least 3 of the 4 skills very well ($p<.05$). Table 6 further demonstrates that students who were in

Table 6

MEAN IQ SCORES OF STUDENTS CLASSIFIED AS LEARNING DISABLED WITH VARYING LEVELS OF REGULAR EDUCATION INSTRUCTION

Percentage of Instructional Time Mainstreamed	Mean IQ Score	Standard Error	N
0% to 25%	78	2.5	93
26% to 50%	83	1.5	102
51% to 75%	87	1.4	180
76% to 99%	91	1.2	194
100%	94	1.5	123

Source: Students' school records.

regular education classes for a greater percentage of the day, which involved academic courses, also had higher IQ scores ($p<.001$).

Accommodations Made for the Needs of Students Classified as Learning Disabled and Regular Education Teachers With Mainstreamed Students

In exploring how students might have been aided to meet the academic expectations of regular education courses, the NLTS finds that 37% of students with learning disabilities attended schools in which the explicit policy was that such students, when mainstreamed, were expected to keep up in regular education classes without help. Almost two-thirds attended schools that apparently acknowledged that some support might be needed for students with learning disabilities to succeed in regular education classes. Accommodations could be of at least three kinds: policies supporting mainstreamed students, direct services to students, or support for teachers serving mainstreamed students.

At the policy level, one accommodation for students with disabilities in mainstreamed classes might involve grading policies. Alternative grading policies for mainstreamed special education students, however, were not

common. The majority of students with learning disabilities (66%) attended schools in which special education students in mainstreamed classes were held to the same grading standard in those classes as nonhandicapped students.

Direct services to most students with learning disabilities involved some instruction in special education courses; as mentioned earlier, only 18% of students spent none of their instructional time in special education courses. Special education classes may have provided support for regular education classes by giving instruction in study skills or help in completing regular education assignments. Other forms of direct service were also investigated in the NLTS, including tutoring assistance, speech therapy, personal counseling, and life skills training. As shown in Table 7, tutoring assistance was rarely provided to students classified as learning disabled; only 18% of students with learning disabilities who attended regular secondary schools received tutoring assistance from the school. Other forms of explicit support services also were provided by regular secondary schools to only a minority of students classified as learning disabled; more than half of students were reported by parents and/or schools as receiving none of the forms of support services investigated in the NLTS.

One might argue that support services, such as tutoring assistance, are not the key to academic success; it is what happens in the classroom in the everyday instructional practices of teachers that is the important influence on students' performance. Although the NLTS did not collect data on

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Table 7
SUPPORT SERVICES RECEIVED FROM REGULAR SECONDARY SCHOOLS BY STUDENTS CLASSIFIED AS LEARNING DISABLED

Services Received	Percentage	Standard Error
Students receiving from or through their school in the 1986-87 school year:		
Tutoring assistance	17.8	2.0
Speech therapy	9.7	1.3
Life skills training/occupational therapy	21.0	2.1
Personal counseling/therapy	14.4	1.8
None of these services	52.9	2.6
N	731	

Source: Parent interviews and/or students' school records.

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classroom teaching directly, we have hypothesized that a regular education classroom teacher's ability to accommodate the varied learning styles of learning disabled students would improve if he/she were provided with support in managing classroom tasks. The NLTS collected data regarding the extent to which regular education teachers with mainstreamed special education students routinely were provided in-service training on the needs of special education students, consultation services from special education professionals, special materials to use with mainstreamed students, reduced class size, and/or classroom aides.

Table 8 indicates that, although virtually all students classified as learning disabled attended schools that routinely had special education professionals provide consultation services to regular education teachers with mainstreamed students, other types of support were much less common. Only about half of students classified as learning disabled attended schools that routinely provided special materials to regular education teachers to use with mainstreamed students in their classes. In-service training on the needs of special education students was routinely provided in schools attended by 44% of students classified as learning disabled. Classroom aides and reduced class size were not often made available.

Thus far, we have a picture of students with learning disabilities functioning with deficits in basic skills and spending the majority of their instructional time in regular education classrooms in which support services, beyond their special education instruction, were not often provided to them or to their regular education teachers. How did these students fare?

Table 8
SUPPORT ROUTINELY PROVIDED BY SECONDARY SCHOOLS TO REGULAR EDUCATION TEACHERS WITH MAINSTREAMED SPECIAL EDUCATION STUDENTS

Type of Support Routinely Provided	Percentage	Standard Error
Consultation with special education teachers	97.1	.8
Special materials for special education students	51.5	2.5
Inservice training on special education issues	44.0	2.5
Classroom aides	28.6	2.3
Reduced class size	10.3	1.5
N	818	

Source: Survey of Secondary Special Education Programs.

Secondary School Performance of Students Classified as Learning Disabled

Academic performance can be measured in numerous ways. Here, we consider two aspects of performance for secondary students with learning disabilities. The first, grade performance, is measured by grade point average (GPA) and receipt of failing course grades. The second aspect of educational performance involves the separation from schooling inherent in the decision to drop out.

Grade Performance

Table 9 indicates that students classified as learning disabled who received grades in their courses had a grade point average (GPA) of 1.94 for all their graded courses in their most recent school year.* This GPA is considerably below the GPA of 2.85 for a national sample of high school

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* Grade point average is calculated on a 4-point scale, with grades of A counted as 4, B as 3, C as 2, D as 1, and F as 0. There is some reason to suspect that the grades abstracted from students' records may slightly overestimate grade performance for some students. When students took a single course for two semesters and received two different grades, data abstractors recruited in schools attended by students in the sample were instructed to record the grade received in the most recent semester. However, when transcripts were obtained for a subsample of students and compared to grades reported by data abstractors, 34% of the 157 cases reviewed showed discrepancies between transcript grades and data abstractors' grades. Most discrepancies involved abstractors reporting the higher of two grades received for two-semester courses, rather than the most recent grade. Generally only one course per student was involved in a grade discrepancy and the grade change was usually only 1 grade point (i.e., a B reported as the higher grade from the first semester when a C was the more recent grade). This overestimation of the GPA for a student with 7 graded courses would be .14 (i.e., the difference between GPAs of 3.0 and 2.86). If this overestimation affected one-third of the full sample, as it did of the cases validated, it would result in a GPA overestimation of .05 for the full sample. However, because the subsample used for this comparison was small and included students from only four disability groups, it is unknown to what extent this tendency to record the more favorable grade rather than the most recent grade pervades the grade data analyzed here for the full sample. Further, in a handful of cases, failed courses were not included on the record abstract form because students received no credit for them. Hence, readers are cautioned that the grade data presented here may paint a somewhat rosier picture of grade performance than students actually achieve; GPAs may actually have been marginally lower and failure rates marginally higher than those reported here. Further, about 5% of students classified as learning disabled did not receive course grades in any classes in their most recent year in secondary school and are not included in the analysis of grade performance. These students were generally more severely impaired and were in ungraded programs. Therefore, students included in the grade performance analysis demonstrate less variation in ability and generally higher ability than would be the case if all students in the category were included.

Table 9
GRADE PERFORMANCE IN THEIR MOST RECENT SCHOOL YEAR BY STUDENTS CLASSIFIED AS LEARNING DISABLED WHO ATTENDED REGULAR SECONDARY SCHOOLS

Grade Performance	Grade Performance In: All Classes	Regular Education Classes	Special Education Classes
Grade point average for students in:			
All grades	1.94	1.89	2.18
	(.04)	(.05)	(.06)
N	774	740	590
Grade 7 or 8	2.00	1.95	2.22
	(.13)	(.15)	(.17)
N	72	67	55
Grade 9 or 10	1.78	1.75	1.98
	(.06)	(.07)	(.09)
N	275	264	212
Grade 11	1.98	1.88	2.36
	(.09)	(.10)	(.12)
N	170	164	130
Grade 12	2.21	2.19	2.43
	(.07)	(.08)	(.10)
N	240	231	178
Percentage receiving a failing grade in one or more courses	34.6	33.4	12.0
	(2.4)	(2.5)	(1.8)
N	808	750	653
Grade 7 or 8	30.9	33.0	12.1
	(7.0)	(7.6)	(5.3)
N	78	68	67
Grade 9 or 10	41.0	40.0	14.8
	(4.0)	(4.1)	(3.2)
N	282	267	231
Grade 11	36.8	34.2	9.9
	(5.1)	(5.1)	(3.5)
N	175	167	141
Grade 12	21.5	19.4	6.2
	(4.0)	(3.9)	(2.7)
N	246	232	189

Source: Students' school records.

seniors in 1980 (Fetters, Brown, and Owings, 1984) and a 4-year GPA of 2.6 for a national sample of students who were sophomores in 1980 (NCES, 1984). Not only is the GPA for students classified as learning disabled lower than the general student population, recent research suggests it is also lower than the GPA for poor-achieving students without disabilities (Donahoe and Zigmond, 1990). Table 9 indicates that students in 9th and 10th grades generally had the most difficult time in terms of grade performance.

Among students classified as learning disabled, the GPA was significantly lower for regular education courses (1.89) than for courses explicitly for special education students (2.18; $p<.001$), regardless of student grade level. Similarly, students classified as learning disabled were significantly more likely to receive a failing grade in a regular education course than in a special education course; 33% of students who took regular education courses received a failing grade in 1 or more of them, compared to 12% of students taking special education courses who failed one or more of those classes ($p<.001$).

Although it is difficult to compare grades for regular and special education courses because of different grading standards or expectations that may apply in those classes, grades serve a labeling function in communicating to students how competent they are as learners. The messages communicated to students from their regular education courses by lower grades was that they were not as competent there as in special education classes. This situation existed despite the fact that mainstreamed students were generally higher functioning and scored higher on IQ tests than their learning disabled peers in special education classes.

Although it appears in bivariate relationships that regular education classes were more likely to generate poor grades for students with learning disabilities than special education placements, we have seen that placement is not independent of student characteristics. Only in a multivariate analysis can the independent relationships between school performance and regular education vs. special education placements be determined.

Reflecting findings of recent research,* the NLTS has hypothesized that school achievement is affected by student demographic and disability-related characteristics; student behaviors; and school characteristics,

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* See for example Alpert and Dunham, 1986; Bachman, 1970; Bachman, Green, and Wirtanen, 1971; Baro and Kolstad, 1986; Donahoe and Zigmond, 1990; Eckstrom et al. (1987); Fetters, Brown and Owings, 1984; Hendrick, MacMillan,and Balow, 1989; Jones et al., 1986; Mahan and Johnson, 1983; Peng and Takai, 1987; Rumberger, 1983 and 1987; Schellenberg, Frye, and Tomsic, 1988; Scott-Jones, 1984; Thornton, et al., 1987; U.S. Bureau of the Census, 1987; Vito and Connell, 1988; Wagner and Shaver, 1989; Wehlage and Rutter, 1986; Wehlage, 1983 and 1989; Zigmond, 1987).

programs and experiences. The following disability-related and demographic variables were included in a multivariate model to determine their independent effects on one measure of achievement: whether students received failing course grades, controlling for other variables in the model.*

- Student behaviors
  - Average days absent from school in most recent year.
  - Youth having disciplinary problems.
  - Group membership, as measured by parents reporting whether the youth had belonged to a school or community gr up in the past year.

- Student characteristics
  - IQ.
  - Functional ability scale score (ranges from 4 to 16).
  - Age in student's last year in school.
  - Being older than the typical age-for-grade, a proxy measure of prior school achievement, suggesting the student had repeated an earlier grade.
  - Gender.
  - Ethnic background (minority vs. nonminority).
  - Household income (4-point scale).
  - Single-parent household.
  - Urban/suburban/rural residence.

Variables selected to represent schools and school programs reflect recent research which suggests that a lack of a social bond between students and their schools may be at the heart of alienation from school and much poor school performance (e.g., Wehlage, 1983 and 1989; GAO, 1987; Rosenblum and Firestone, 1988; Pittman and Haughwout, 1987; Finn, 1989). A social bond is apparent when a student "is attached to adults and peers, committed to the norms of the school, involved in school activities, and has belief in the legitimacy and efficacy of the institution" (Wehlage et al., 1989). This theory contends that when these aspects of social bonds are missing, students will fail to attend school or, when present at school, fail to give full attention or effort to the educational process.

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* The appendix includes a table presenting the unweighted means for all variables included in the model for the 589 students included in the multivariate analysis and for the full sample of students classified as learning disabled. Correlations between the dependent variable and independent variables for both groups are also included. Virtually no significant differences exist between the subsample included in the model and the larger sample of students, indicating the subsample is representative of the larger group of students.

Social bonds are often difficult to establish for students in secondary school. Large student enrollments, the demands of multiple classes taught by teachers with varied expectations for students, and the complexities of adolescent peer relationships may make secondary schools a difficult environment within which to establish the commitment and involvement that social bonds entail. Bonding is considered easier to establish in smaller schools and in programs which students believe are relevant to their goals and interests and in which they are given direct, personal attention from adults whom students perceive care about them. Reflecting this theory, the following school and program characteristics were included in an analysis of course failure:

- Percentage of instructional time in regular education
- Participation in occupationally-oriented vocational education as a course of study relevant to students with learning disabilities, most of whom do not pursue postsecondary academic training.
- Receipt of tutoring assistance as an indicator of individual assistance.
- School size.
- Whether mainstreamed students or teachers with mainstreamed students were given extra support, thereby enabling more individualized instruction.

Findings from a multivariate logistic regression analysis relating disability, demographic, and school/program characteristics to whether students received a failing course grade in their most recent year are described below; the effects on the probability of receiving failing grades of significant independent variables are summarized in Table 10.*

Student behaviors. The NLTS analysis suggests that poor grade performance is part of a constellation of difficulties youth classified as learning disabled may have, which includes school absenteeism and having various kinds of disciplinary problems. As found in other research (Thornton et al., 1987; Donahoe and Zigmond, 1990; Schellenberg, Frye, and Tomsic, 1988), students classified as learning disabled who were absent more from school were significantly more likely to receive failing grades than students whose attendance was better, independent of other factors in the analysis. About half of students classified as learning disabled were absent from school 10 days or fewer in their most recent school year. However, almost

* Logistic regression coefficients and significance levels for all variables in the model are included in the appendix.

Table 10
FACTORS SIGNIFICANTLY AFFECTING THE PROBABILITY OF RECEIVING A FAILING GRADE AMONG STUDENTS CLASSIFIED AS LEARNING DISABLED

Significant Factors	Probability of Receiving A Failing Course Grade
Student Behaviors	
Student was absent from school:	
8 days	25.5***
18 days	36.2
Student had disciplinary problems	
Yes	46.4**
No	29.7
Students Demographics	
Student age:	
16	37.4*
18	30.8
Student gender:	
Male	36.4**
Female	20.9
Students' School Program Characteristics	
Student was mainstreamed for:	
3 classes	27.9*
4 classes	30.4
5 classes	33.0
6 classes	35.7
7 classes	38.5
Student received grades for:	
3 classes	15.8***
4 classes	20.0
5 classes	24.9
6 classes	30.5
7 classes	36.8

N=589

Significance levels:
* =.05
** =.01
*** =.001

The multivariate logistic regression model also controls for students socioeconomic status, functional ability, IQ, urbanicity, ethnicity, being older than age-for-grade, group membership, enrollment in vocational education, school policies toward mainstreamed students, and extent of support provided mainstreamed students and their teachers by the school.

1 in 4 students were absent more than 20 days, with average absenteeism for the group of 15 days. NLTS analyses estimate that, for students who had average values on other variables in the analysis, the probability of receiving a failing grade was 26% for those who were absent from school 8 days and 36% for those who were absent 18 days ($p<.001$).

Further, students who had experienced disciplinary problems of various kinds (e.g., being suspended from school, fired from a job, arrested) also were significantly more likely to receive failing grades than students who had not had such difficulties. The probability that students with disciplinary problems would receive a failing grade is estimated to be 46%, compared to 30% for other students ($p<.01$). Group membership was not significantly related to course failure, independent of other factors in the model.

Student characteristics. Two demographic factors were demonstrated to have significant independent effects on receipt of failing course grades: age and gender. Younger students were significantly more likely to receive failing grades than older students, probably because students who fail in school often drop out of school; older students who persist in school are those with higher achievement. For example, among youth with disabilities, 16% dropped out of school at age 16 or younger; hence, 17 year-olds still in school would not reflect the presence of students who had done poorly in school and left at an earlier age. NLTS analysis estimates the probability of a 16 year-old student classified as learning disabled receiving a failing grade to be 37%, with other variables in the model at mean values; the probability of an 18 year-old student receiving a failing grade is estimated to be 31% ($p<.05$).

Male students were significantly more likely to receive failing grades in school than were females, independent of such factors as having disciplinary problems, which are also more often associated with males. Males are estimated in the multivariate analysis to have a 26% probability of receiving a failing grade, compared to 21% for female students classified as learning disabled ($p<.01$). This finding is consistent with research on the general student population, which indicates generally higher grades for high school girls than boys (NCES, 1984).

Generally weak relationships were found between other demographic characteristics and receipt of failing grades. For example, ethnicity, urbanicity, and socioeconomic status were not found to have a significant independent relationship to course failure, unlike findings for the general student population. However, the absence of independent significant relationships may be misleading. Earlier NLTS analyses (Wagner and Shaver, 1989), revealed that the presence in the multivariate model of behaviors often associated with low-income urban minorities, such as school absenteeism and disciplinary problems, mediates the effects of demographic characteristics. When these behavioral factors were left out of analyses, socioeconomic status and ethnicity had the expected significant relationship to course failure.

Weak relationships were also found between course failure and student abilities, as measured by the functional ability scale score and IQ. Although each of them was related to course failure in the expected direction, neither was statistically significant, perhaps because of their intercorrelation.

School program characteristics. The extent to which students were mainstreamed continues to demonstrate the negative association with course failure that was suggested in bivariate analyses presented earlier. For example, NLTS analyses estimate the probability of receiving a failing grade to be 30% for students mainstreamed for 4 courses, and 36% for those mainstreamed for 6 courses ($p<.05$), independent of students' abilities and other factors in the model. Consistent with this finding regarding mainstreaming, we also find, logically, that receiving grades in more courses increased the probability that one of those grades would be a failing grade ($p<.001$). Students who were mainstreamed received grades in more courses than students who were not, reinforcing the conclusion that students classified as learning disabled whose school programs come closest to approximating those of their nonhandicapped peers (e.g., in regular education classes for which grades were given), were significantly more likely than other students with learning disabilities to receive a failing grade, independent of their IQ, functional abilities and other factors in the analysis.

Although this analysis of the relationships of individual variables to course failure reveals some interesting findings, we know that student or school program characteristics often cluster together, with more powerful effects than any single characteristic would have. For example, we know that several of the demographic characteristics examined are correlated. Therefore, they compete with each other in explaining variation in the dependent variable, reducing the statistical significance of each variable individually. If we cluster the demographic characteristics into particular profiles of youth, their power is more apparent.

To illustrate, a profile of a typical at-risk youth with learning disabilities might be an urban male from a low-income, minority, single-parent household who was older than the typical age-for-grade because he has been retained in grade earlier in his school career. This combination of demographic and achievement characteristics combines to bring the estimated probability of this student receiving a failing grade to 42%. In contrast, a white female student with a learning disability from a moderate income family living in the suburbs who had not been retained in grade would have an estimated probability of receiving a failing grade of only 19%.

The association of student demographics to grade performance is powerful. However, student behaviors, which are more amenable to influence, also demonstrate strong relationships. The estimated probability of grade failure for the at-risk male described above would not be 42%, but 33%, if his absenteeism averaged 7 days rather than the average of 15 days. High absenteeism can be attacked directly in the schools by programs that actively seek to build stronger bonds of affiliation between students and their schools.

NLTS data suggest that some combinations of educational programs and policies also can reduce the probability of failing in school, even for students with many characteristics that put them at high risk of failure. For example, the probability of receiving a failing grade for the at-risk student described above, estimated to be 42% based on demographic characteristics alone, is estimated to be 52% if he attended a school in which he was mainstreamed for 6 classes, received no tutoring assistance, and school policies provided little support to him or his regular education teachers in

meeting academic standards equivalent to those for nondisabled students. In contrast, if that at-risk student was mainstreamed for 5 classes and received tutoring assistance in a school with policies more supportive of mainstreamed students, and that routinely provided in-service training and special materials to regular education teachers with mainstreamed students, estimates of the probability of his receiving a failing grade would be 32%, not 52%. Clearly, school programs and characteristics have a role to play in ameliarating course failure among students classified as learning disabled.

Dropping Out

Dropping out of school is a serious problem among students classified as learning disabled. The NLTS finds that 32% of students classified as learning disabled who left school in the 1985-86 or 1986-87 school years left voluntarily without graduating. Among youth in the learning disabled category, 3% left school because they exceeded the age limit for attendance, 4% were suspended or expelled, and 61% graduated. This rate of graduation is quite similar to a graduation rate of 62% reported by states for students with learning disabilities for the 1985-86 school year (U.S. Department of Education, 1988). Either of these graduation rates for students with learning disabilities is markedly lower than comparable figures for the general student population. For example, the U. S. Department of Education Wall Chart estimated the graduation rate for the general student population in 1985 was 71%; the Center for Education Statistics and the U.S. Bureau of the Census separately estimated a graduation rate of 74% (CES, 1986; U.S. Bureau of the Census, 1987b).

Experiencing school failure, as communicated by the receipt of failing course grades, appears to have had a powerful role in the dropout decision. When we examine all students classified as learning disabled, whether or not they were still in secondary school, we find that 9% were dropouts from school rather than "persisters"--students who were still in school or who had stayed in until they graduated or aged out. However, the percentage of students who were dropouts was about three time as high (16%) for students who had received a failing grade in their most recent school year than for students who had not (5%; $p<.01$).

This relationship is sustained in multivariate analyses that control for the same student characteristics and behaviors and school program characteristics as discussed for the analysis related to receipt of failing grades. By adding to that set of factors a variable indicating whether students receiving a failing grade, we see the independent relationship of course failure to whether students were dropouts, rather than persisters.

Table 11 indicates the factors that a multivariate logistic regression analysis has shown to have significant relationships to whether youth dropped out or persisted in school.* In this multivariate context, course failure is one of the most powerful predictors of dropping out ($p<.001$). This NLTS multivariate analysis estimates that the probability of dropping out would be 16% for students who had received a failing grade and 4% for those who had not, when other variables in the model are held at the mean. These rates are almost identical to the rates shown in the bivariate relationships reported above, indicating that other factors in the model are not strong mediators of the relationship between course failure and dropping out. This finding is consistent with research on the general population of students, which suggests that poor performance in school is among the strongest influences on dropout behavior (e.g., Eckstrom et al., 1986).

Let us again consider our hypothetical at-risk urban male student. If this student, by attending a school with the policies and programs associated with higher course failure that were described above, actually received a failing course grade, the estimated probability of his dropping out of school would be 18%. If, however, a student with the same demographic characteristics attended a school with the policies and programs that related to lower probabilities of course failure (e.g., tutoring assistance, support for teachers), and those program features were successful in helping him avoid receiving a failing grade, the estimated probability of his dropping out of school would be 1%.

The analysis also demonstrates potent relationships between dropping out and students' absenteeism and disciplinary problems. They not only relate to

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* Logistic regression coefficients and significance levels for all variables in the model are included in the appendix.

Table 11
FACTORS SIGNIFICANTLY RELATED TO THE PROBABILITY OF DROPPING OUT OF SCHOOL AMONG STUDENTS CLASSIFIED AS LEARNING DISABLED

Significant Factors	Estimated Probability of Dropping Out
Student Behaviors	
Student failed one or more courses:	
Yes	15.6***
No	4.5
Student was absent from school:	
8 days	5.9*
18 days	7.4
Student had disciplinary problems	
Yes	22.0***
No	5.8
Student belonged to school/community group:	
Yes	3.1**
No	10.4
Students Demographics	
Student IQ was:	
80	4.9*
100	9.6
Student ethnicity was:	
Minority	2.4*
White	9.6
Students' School Program Characteristics	
Student received tutoring assistance:	
Yes	1.2*
No	9.3

N=589

Significance levels:
* = .05
** = .01
*** = .001

The multivariate logistic regression model also controls for students' gender, age, socioeconomic status, functional ability, urbanicity, being older than age-for-grade, enrollment in vocational education, percentage of time in regular education, school policies toward mainstreamed students, and extent of support provided teachers of mainstreamed students by the school.

a higher probability of course failure, as demonstrated in Table 10, but, along with grade failure, have further independent relationships to a higher probability of dropping out of school, as presented in Table 11. Added to these behaviors, we find that an absence of membership in a school or community group also relates to a higher probability of dropping out of school. Our hypothetical at-risk urban male student has an estimated probability of dropping out that is 10 times higher if he is also a student with high absenteeism, disciplinary problems, and no group affiliation. These findings support the theory that a lack of affiliation or school membership is at the heart of students' decisions to become completely separated from school by dropping out.

Regarding student chararcteristics, it is interesting to note that more able students, as indicated by IQ scores, have significantly higher estimated probabilities of dropping out of school, as do white students, when other variables are held at the mean ($p<.05$). Perhaps these students perceive they have greater opportunities in the world outside of school than do minority students or those with lower intelligence scores. Other demographic factors included in the model (age, gender, household income, urbanicity and single-parent households) did not have significant relationships to dropping out of school, independent of the student behaviors included in the analysis.

The analysis also reveals that school and program factors have generally weak associations with students dropping out rather than persisting in school, independent of student performance. For example, once students were failing in school, the extent of mainstreaming does not appear to have had a significant independent relationship to the drop out decision, nor did most other school program characteristics. They appear to be more potent influences on whether students achieve or fail in their courses, through which they indirectly relate to dropping out.

The one exception* to the weak relationships of school characteristics to dropping out is a significant association between providing tutoring assistance and persisting in school. The data suggest that, for students with average values on other factors in the analysis, those receiving no

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* Being enrolled in occupational vocational courses is associated with a lower probability of dropping out, but marginally misses the test of statistical significance ($p<.06$).

tutoring assistance have an estimated probability of dropping out of school of 9%, compared to 1% for students receiving such assistance ($p<.05$). This relationship of tutoring assistance to school persistence may relate to increased learning by students who receive it. It may also relate to the beneficial effects of any kind of individualized positive attention. The social bonding theory contends that a caring attitude on the part of adults in the school system is a key component of effective drop out prevention programs. Tutors may communicate this kind of caring attitude and the belief that the student can and should succeed.

Summary and Implications

Students classified as learning disabled bring to the educational process one or more of a wide variety of disability-related obstacles to learning. In addition, they are more likely than other students also to bring learning problems associated with economic disadvantage.

At the secondary school level, these students already are largely the responsibility of the regular education system, with the majority of students spending the majority of their instructional time in regular education classes. The regular education initiative would seem to have only limited potential in increasing the mainstreaming of students with learning disabilities at the secondary level.

But what happens to students in those placements? NLTS data demonstrate that the majority of secondary students with learning disabilities are held to the same grading standard as nondisabled students in regular education classes, and generally are not provided direct services, such as tutoring assistance, in order to meet academic expectations, beyond what is available through their special education courses. Neither are regular education teachers routinely provided with substantial direct support for instruction of students with learning disabilities. This situation occurs despite the disability-related and economic disadvantages that such students may bring to the educational process.

In this situation, many students with learning disabilities are finding the regular education classroom a difficult environment in which to succeed. NLTS data suggest that students classified as learning disabled were more likely to do poorly in terms of grade failure the more time they spent in regular education classes, independent of their ability levels, IQ, or demographic characteristics. That course failure powerfully relates to whether students then dropped out of school rather than remaining in school or graduating. Encouraging greater instruction of students with disabilities in regular education classes, without serious attention to the instruction that goes on in those classes, would seem simply to encourage greater rates of academic failure.

But we must interpret these results with caution. Although many students with learning disabilities experienced academic failure in terms of course grades in regular education settings, the majority did not. Much more is affecting school performance for students with learning disabilities than their educational placement. It is clear that students with learning disabilities can be instructed poorly in either regular education or special education settings; they can be instructed well in either setting. Greater attention by researchers and practitioners to identifying the factors that constitute effective instruction for students with learning problems would enable the field to move closer to the goal of helping students with learning disabilities achieve academically, regardless of their placement.

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Appendix

OVERVIEW OF THE NATIONAL LONGITUDINAL TRANSITION STUDY OF SPECIAL EDUCATION STUDENTS

As part of the 1983 amendments to the Education of All Handicapped Children Act (EHA), the Congress requested that the U.S. Department of Education conduct a national longitudinal study of the transition of secondary special education students to determine how they fare in terms of education, employment, and independent living. A 5-year study was planned, which was to include youth from ages 13 to 21 who were in special education at the time they were selected and who represented all 11 federal disability categories.

In 1984, the Office of Special Education Programs (OSEP) of the U.S. Department of Education contracted with SRI International to determine a design, develop and field test data collection instruments, and select a sample for the National Transition Study. In April 1987, under a separate contract, SRI began the actual study.

Study Components

The National Transition Study has four major components:

- *The Parent/Youth Survey*. In 1987, parents were interviewed by telephone to determine information on family background and expectations for the youth in the sample, characteristics of the youth, experiences with special services, the youth's educational attainment (including postsecondary education), employment experiences, and measures of social integration. This survey is expected to be repeated in 1990, when the youth will be interviewed if he/she is able to respond.

- *School Record Abstracts*. Information has been abstracted from the school records of sample youth for their most recent year in secondary school (either the 1985-86 or 1986-87 school years). Information abstracted from school records relates to courses taken, grades achieved (if in a graded program), placement, related services received from the school, status at the end of the year, attendance, IQ, and experiences with minimum competency testing. Records will be abstracted again in 1989 for youth still in secondary school in the 1988-89 school year.

- *School Program Survey*. Schools attended by sample youth in the 1986-87 school year were surveyed in 1987 for information on student enrollment, staffing, programs and related services offered secondary special education students, policies affecting special education programs and students, and community resources for the disabled.

- *Explanatory Substudies*. More in-depth studies involving subsamples of the main sample will be conducted in 1989 and 1990 to examine the pattern of transition outcomes achieved by youth who are out of secondary school and the relationship between school experiences and transition outcomes.

Sampling

Youth were selected for the sample through a two-stage sampling procedure. A sample of 450 school districts was randomly selected from the universe of approximately 14,000 school districts serving secondary (grade 7 or above) special education students, which had been stratified by region of the country, a measure of district wealth involving the proportion of students in poverty (Orshansky percentile), and district size (student enrollment).* Because of a low rate of agreement to participate from these districts, a replacement sample of 176 additional districts was selected. In addition, participation in the study was invited from the approximately 80 special schools serving secondary-age deaf, blind, and deaf-blind students. A total of approximately 300 school districts and 25 special schools agreed to have youth selected for the study.

Analysis of the potential bias of the district sample indicates no systematic bias that is likely to have an impact on study results when responding districts were compared to nonrespondents on the types of disabilities served, special education enrollment, participations in Vocational Rehabilitations agency programs, the extent of school-based resources for special education, community resources for the disabled, the configuration of other education agencies serving district students, metropolitan status, percent minority enrollment, grades served, and the age limit for service (see Javitz, 1987 for more information on the LEA bias analysis).

The sample of students was selected from rosters of all special education students ages 13 to 21 who were in grades 7 through 12 or whose birthdays were in 1972 or before. The roster of such students was stratified into 3 age groups (13 to 15, 16 to 18, over 18) for each of the 11 federal handicap categories and youth were randomly selected from each age/condition group so that at least 1,000 students would be selected in each handicap category (with the exception of deaf-blind, a low-incidence condition).

Exhibit A indicates the number of youth sampled in each condition, the proportion for which different combinations of data were obtained, and the reasons for nonresponse for youth for whom data could not be obtained.

Weighting Procedures and Population to Which Data Generalize

Youth with disabilities for whom data could be gathered were weighted to represent the U.S. population of such youth. In performing this weighting, three mutually exclusive groups of sample members were distinguished:

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* The 1983 Quality Education Data, Inc. (QED) database was used to construct the sampling frame. QED is a private nonprofit firm located in Denver, Colorado.

Exhibit A

Student Sample by Handicapping Condition

Status	LD	SED	MR	Speech	Ortho	Deaf	H of H	Blind	D/B	Health	Multi	Total
Number of contacts	1650	1321	1642	933	1060	1050	1372	1318	165	1005	1132	12648
No Further Contact Possible												
Unable to locate	59	59	84	50	49	41	70	63	5	33	45	558
Names not provided by LEA	206	271	55	92	18	99	197	120	0	362	212	1632
Deceased	2	0	4	0	11	0	3	2	3	5	2	32
Language barrier/non-Spanish	5	4	5	9	6	12	13	3	0	5	2	64
No respondent exists	23	21	28	18	9	20	11	20	2	9	16	177
Other	3	3	7	5	1	14	6	2	3	5	6	55
Nonworking number	233	178	341	157	146	149	180	193	29	115	94	1815
TOTAL	531	536	524	331	240	335	480	403	42	534	377	4333
(Percentage of total contacts)	32	41	32	35	23	32	35	31	25	53	33	34
Responses												
Completed interview-have consent form	506	326	533	232	388	402	470	475	73	246	362	4013
Completed interview-no consent form	385	258	314	217	216	259	231	255	35	131	159	2460
Total completed interviews	891	584	847	449	604	661	701	730	108	377	521	6473
(% of total contacts)	54	44	52	48	57	63	51	55	65	38	46	51
(% of those to be interviewed)	64	59	57	57	62	73	64	64	69	62	60	62
Have partial data (other sources)	37	43	42	18	35	15	15	20	2	11	24	262
Have partial interview (phone)	39	25	27	25	16	26	17	17	4	19	22	237
Have partial interview (mail)	20	21	49	15	25	23	17	20	4	10	30	234
Total participation	987	673	965	507	680	725	750	787	119	417	597	7206
(% of total contacts)	60	51	59	54	64	69	55	60	72	41	53	57
(% of those to be interviewed)	71	68	64	64	69	80	68	69	75	69	68	69
Refused interview	56	41	40	11	30	19	24	22	3	18	18	282
Refused in earlier contacts	11	3	6	2	20	0	1	3	1	3	9	59
Total refusals	67	44	46	13	50	19	25	25	4	21	27	341
(% of total contacts)	4	3	3	1	5	2	2	2	2	2	2	3
(% of those to be interviewed)	5	4	3	2	5	2	2	2	3	3	3	3
Other	29	20	19	22	8	64	18	18	4	14	22	238

A. Youth whose parents responded to the telephone-administered Parent Interview.

B. Youth whose parents did not respond to the telephone-administered Parent Interview, but were interviewed in the in-person nonrespondent study.

C. Youth whose parents did not respond to either the telephone or in-person Parent Interview, but for whom the school provided a record abstract.

All sample members belong to one of these three groups.

A primary concern in performing the weighting was to determine whether there was a nonresponse bias and to calculate the weights in such a way as to minimize that bias. Nonresponse bias was primarily of three types:*

1. Bias attributable to the inability to locate respondents because they had moved or had nonworking telephone numbers.

2. Bias attributable to refusal to complete a parent interview.

3. Bias attributable to circumstances that made it infeasible for the record abstractors to locate or process a student's record.

Of these three types of nonresponse, the first was believed to be the most important, both in terms of frequency and influence on the descriptive and explanatory analysis. Type 1 bias was also the only type of nonresponse that we could estimate and correct.

We estimated the magnitude of type 1 nonresponse bias by comparing responses on identical (or very similar) items in the three groups of respondents (after adjusting for differences in the frequency with which different handicaps were selected and differences in the size of the LEAs selected). Group A respondents were wealthier, more highly educated, and more likely to be Caucasian than group B respondents. In addition, group A respondents were much more likely to have youth who graduate from high school than group B or C respondents (who had similar dropout rates). On all other measurable items, the youth described by the three groups were similar, including sex, employment status, pay, self-care skills scale, household-care activities scale, functional mental skills scale, association with a social group, and length of time since leaving school. SRI determined that

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* In addition, there was a large group of nonrespondents who could not be located because their LEAs would not provide student names. Presumably, had these student names been available, many of those nonrespondents would have chosen to participate at about the same rate as parents in districts in which youth could be identified. The remaining nonrespondents would presumably have been distributed between the three types of nonresponse mentioned above.

adjusting the weights to eliminate bias in the income distribution would effectively eliminate bias in parental educational attainment and racial composition, but would have a negligible effect on dropout rates. It was also determined that group B and C respondents were present in sufficient numbers that if they were treated as no different from the group A respondents in the weighting process, the resultant dropout distribution would be approximately correct.

Weighting was accomplished using the following sequence of steps:

(1) Data from all three groups were used to estimate the income distribution for each handicapping condition that would have been obtained in the absence of type 1 nonresponse bias.

(2) Respondents from all three groups were combined and weighted up to the universe by handicapping condition. Weights were computed within strata used to select the sample (i.e., LEA size and wealth, and student age).

(3) Weights from four rare handicapping conditions (deaf/blind, deaf, orthopedically impaired, and visually impaired) were adjusted to increase the effective sample size. These adjustments primarily consisted of slightly increasing the weights of students in larger LEAs and decreasing the weights of students in smaller LEAs. Responses before and after these weighting adjustments were nearly identical, except for the deaf/blind. The adjustment for the deaf/blind consisted of removing a single respondent from a medium-sized LEA, who was being weighted up to represent two-thirds of all deaf/blind students. Hence, survey results do not represent deaf/blind students in medium or smaller-sized LEAs.

(4) The resultant weights were adjusted so that each handicapping condition exhibited the appropriate income distribution estimated in step 1 above. These adjustments were of modest magnitude (relative to the range of weights within handicapping condition)--the weights of the poorest respondents were multiplied by a factor of approximately 1.6 and the weights of the wealthiest respondents were multiplied by a factor of approximately 0.7.

Statistical Tests

A statistical procedure was used to compute the approximate standard errors of proportions and to test the difference between two proportions. We first computed the weighted percent of "yes" respondents to a survey item and then computed the effective sample size (i.e., the sum of the weights squared, divided by the sum of the squared weights). These two quantities were then used in the usual formula for the variance of a binomially distributed variable (i.e., pq/n where p is the weighted proportion of "yes" responses, q is the complement of p, and n is the effective sample size). To test the difference of two weighted proportions, we computed the difference between the weighted proportions and divided this quantity by the square root of the sum of the variances of the two proportions.

This procedure is only approximately correct because it adjusts only for the difference in weights, but not for cluster-sampling induced covariance among respondents. We are currently in the process of using pseudo-replication to compute more accurate variance estimates. We expect that the true variances are larger than calculated by the effective sample size method, and therefore that stated significance levels (e.g., $p < .01$) will be somewhat too small. Consequently, we have tended to be very conservative, and for the most part, highlight results that are significant at the .005 level.

Analysis

The first stage of the analysis study involves producing descriptive findings related to individual and family characteristics of youth, their experiences with services, their secondary school program, and their outcomes in terms of education, employment, and independent living. Descriptive questions include the following:

- What are the individual and family characteristics of handicapped youth served under EHA?
- What educational experiences and related services are handicapped youth provided under EHA? How do these vary for youth with different handicapping conditions and of different ages? What is the content, duration, intensity, coordination, and provider of these services?
- What are the characteristics of the schools serving youth with disabilities (e.g., with respect to grade levels served, programs and staff available, policies and practices regarding students with disabilities)?
- What are the achievements of youth with disabilities related to their education (secondary school and postsecondary), employment, and independence? How do these vary for youth with different kinds of disabilities?
- What combinations of services, experiences, and outcomes form transitional life paths for youth with different kinds of disabilities?

The second analysis stage will involve multivariate analyses to determine the relationships among the variables depicted in the conceptual model. Explanatory questions include:

- What factors combine to explain the patterns of services that youth receive?
- What factors explain the educational, employment, and independence outcomes of handicapped youth?
- What explains the paths youth take through secondary school and beyond with respect to services, experiences, and outcomes?

Reporting

Findings of the study will be presented in several forms through several channels. Statistical almanacs will present all the descriptive information available from the study for the total handicapped youth population and for each individual handicapping condition. Dissemination activities will entail conference presentations, journal articles, and mailings of key findings to participants in the study and others interested in its findings. A series of special topic reports will present findings from analyses addressing specific policy or research questions. Four methodology reports will detail the sampling, data collection, and analysis procedures used for the project and the reliability/validity of findings. A final report to OSEP will provide comprehensive documentation of findings.

COMPARISON OF UNWEIGHTED MEANS AND CORRELATIONS BETWEEN INDEPENDENT VARIABLES AND WHETHER STUDENTS RECEIVED FAILING GRADES OR DROPPED OUT OF SCHOOL FOR ALL STUDENTS CLASSIFIED AS LEARNING DISABLED AND FOR THOSE IN MULTIVARIATE MODELS*

	Mean Values for:		Correlations with Getting failing grades:		Correlations with Drop Out for:	
Analytic Variables	All LD** Students	LD Students in Failure Model***	All LD Students	LD Students in Models	All LD Students	LD Students in Models
Dependent measures						
Received failing grade	33.4	31.9	1.00	1.00	.22***	.18***
Dropped out	10.7	6.8	.22***	.18***	1.00	1.00
Student characteristics						
Functional ability scale score	14.6	14.6	-.03	-.03	-.07*	-.01
IQ	91.7	89.6	-.04	-.02	.02	.08*
Age	17.8	17.6	-.10***	-.11**	.11***	.09*
Male	74.4	74.0	.08**	.11**	.04	.05
Older than age-for-grade	79.6	77.4	-.01	-.02	.08**	.06
Minority	27.9	26.1	.10**	.09*	-.02	-.10*
Household income scale score	3.0	3.0	-.08*	-.04	-.07*	-.00
Urban residence	28.6	29.0	.11***	.12**	.02	-.05
Rural residence	34.5	34.5	-.08**	-.09*	-.02	.03
Single parent household	31.0	28.9	.08*	.06	.04	.01
Student behaviors						
Days absent from school	15.2	14.3	.32***	.29***	.22***	.16***
Belonged to school/community group	33.9	36.2	-.01	-.03	-.18***	-.12**
Had disciplinary problems	16.7	14.3	.16***	.17***	.29***	.18***
School program characteristics						
Percent time in regular ed.	64.5	64.4	.03	.02	-.05	-.01
Took occupationally-oriented vocational education	55.8	70.1	-.04	-.04	-.09***	-.05
Number of courses for which grades received	6.0	6.2	.15***	-.18***		
Got tutoring assistance	12.2	16.5	.01	.00	-.07**	-.10**
School enrollment	1044	1020	.10***	.10*	.05	-.01
Special ed. students held to same grading standard as regular ed. students in regular ed. classes	59.9	59.9	.10**	.10*	-.04	-.06
Mainstreamed students expected to keep up without help	33.6	34.0	.06	.08	.01	.01
Teachers with mainstreamed students routinely provided:						
Special materials	52.8	51.8	.04	-.03	-.04	-.02
Inservice training	43.8	41.6	.04	.02	-.00	.05
Classroom aides	30.6	31.6	.06	.06	-.01	-.01
Smaller class size	11.1	11.5	.01	.02	.02	.05

* Significance levels for correlations involving all LD students are expected to be higher generally than significance levels for the models because of the larger sample size involved with the full sample of LD students. Readers should focus on the magnitude of the coefficients, not merely significance levels.

** N ranges from 1045 to 1429

*** N=589

LOGISTIC REGRESSION COEFFICIENTS AND SIGNIFICANCE LEVELS FOR INDEPENDENT VARIABLES INCLUDED IN MODELS PREDICTING WHETHER STUDENTS WITH LEARNING DISABILITIES RECEIVED FAILING GRADES OR DROPPED OUT OF SCHOOL

	Model Predicting Course Failure		Model Predicting Dropping Out	
Analytic Variables	Coefficient	Significance	Coefficient	Significance
Intercept	.00	.999	-7.79	.014
Student behaviors				
Days absent from school	.05	.000	.02	.049
Belonged to school/community group	.01	.975	-1.31	.014
Had disciplinary problems	.72	.009	1.52	.001
Student received failing grade			1.36	.001
Student characteristics				
Functional ability scale score	-.08	.163	-.08	.487
IQ	-.01	.174	.04	.030
Age	-.15	.037	.13	.319
Male	.77	.002	-.19	.706
Older than age-for-grade	-.07	.788	.82	.180
Minority	.08	.760	-1.46	.032
Household income scale score	.02	.816	-.01	.950
Urban residence	.31	.275	-.42	.475
Rural residence	.08	.759	.53	.270
Single parent household	-.01	.954	-.00	.993
School program characteristics				
Percent time in regular ed.	.01	.034	-.00	.955
Took occupationally-oriented vocational education	-.24	.299	-.76	.059
Number of courses for which grades received	.28	.000		
Got tutoring assistance	-.11	.686	-2.10	.051
School enrollment	.00	.399	.00	.741
Special ed. students held to same grading standard as regular ed. students in regular ed. classes	.08	.717	-.55	.187
Mainstreamed students expected to keep up without help	.34	.138	.49	.278
Teachers with mainstreamed students routinely provided:				
Special materials	-.26	.223	-.61	.141
Inservice training	.07	.737	.44	.276
Classroom aides	.30	.192	-.04	.922
Smaller class size	.32	.314	.50	.342
X^2	112.2		78.2	
p<	.001		p<.001	
N=	589		589	