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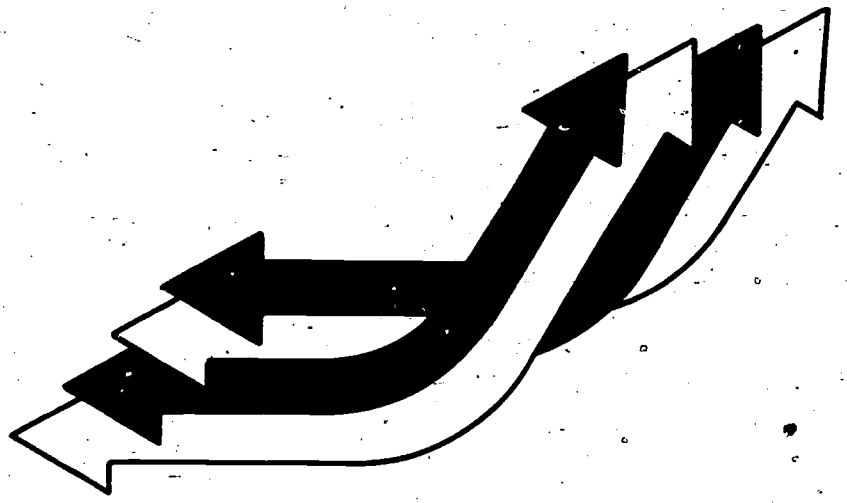
ABSTRACT

The report presents data from the base year (1980) and first followup (1982) of a longitudinal study of U.S. high school seniors and sophomores. Students were asked in self-administered questionnaires whether they had any of seven specific handicaps; whether they had a condition that limited the kinds or amounts of work or education they could obtain; and whether they had participated in special programs for the physically or educationally handicapped. Using the reports of students in 1980 and 1982, the percentage of continuously handicapped students was estimated at 4% for the senior cohort and 6% for the sophomore. To examine explanations for inconsistency between student responses at the two times, student self-identification as handicapped was examined in relationship to cognitive tests, maintenance in school in 1982, and self-reported grades. Analysis revealed support for the hypothesis that self-reported handicap status is associated with real differences among students. Differences were also found in locus of control, self-esteem, and affective balance. Those students identified by teachers as handicapped in 1980 were likely to have poor test scores and were more likely to have dropped out by 1982. (CL)

High School and Beyond

a national longitudinal study for the 1980's

Characteristics of High School Students Who Identify Themselves as Handicapped



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"The purpose of the Center shall be to collect and disseminate statistics and other data related to education in the United States and in other nations. The Center shall . . . collect, collate, and, from time to time, report full and complete statistics on the conditions of education in the United States; conduct and publish reports on specialized analyses of the meaning and significance of such statistics; . . . and review and report on education activities in foreign countries."--Section 406(b) of the General Education Provisions Act, as amended (20 U.S.C. 1221e-1).

June 1985

Preface

The data and analyses presented in this report are mainly from the base year (1980) and first follow-up (1982) of the National Center for Education Statistics (NCES) study, High School and Beyond (HS&B), a longitudinal study of U.S. high school seniors and sophomores. This study was conducted for NCES by the National Opinion Research Center at the University of Chicago. Data from other studies have been drawn upon extensively to cross validate the HS&B findings. The other studies are cited in the report where they are used.

High School and Beyond is a longitudinal survey of large samples of youth who were high school sophomores and seniors in 1980. It involves the construction of a complex, comprehensive data base, including student questionnaire and cognitive tests data; information from school administrators and teachers; high school and college transcripts and other school record information; survey data from parents of selected students; and data from the Bureau of the Census, the Department of Labor, and other Department of Education files. Although the primary focus of the study is on educational processes and outcomes, detailed data are also collected on career development, labor force participation and military service, as well as on a variety of personal and family characteristics. Relatively little attitude or opinion data are collected.

The central purpose of the study is to assist in the formulation and evaluation of education policy at the Federal, State and local levels. From the outset, however, an attempt has been made to maximize the utility (and, hence, the use) of the data to the entire spectrum of interests within the education community.

Study Design

In the base year survey (1980), random samples of approximately 36 sophomores and 36 seniors were selected from each of over 1,000 secondary schools. These schools (the primary sampling units for students) were seleted by means of a complex stratified design which allowed oversampling of particular types of schools (e.g., private schools and schools with higher concentrations of minority students). Each student was asked to fill out a questionnaire and take a 1-hour test. Over 30,000 sophomores and 28,000 seniors participated. School administrators were also asked to complete a school questionnaire and teachers of selected students were asked to provide comments on the characteristics and performance of those students. Data on financing postsecondary education were collected from the parents of over 3,000 members of each student cohort.

In the first follow-up (1982), the senior cohort sample was reduced to just over 12,000 cases. Retention of students in the follow-up was determined by a complex sampling plan which attempted both to preserve policy-relevant subgroups and to minimize losses in statistical efficiency. Questionnaires were mailed to members of the senior cohort in February of 1982. Data was obtained from 94 percent of the senior cohort sample (75 percent by mail and 19 percent by telephone and face-to-face interviews). A public-use tape of the Senior Cohort Data File was released in July 1983.

All members of the 1980 sophomore cohort who were still enrolled in their base year schools (approximately 25,300) were retained in the first follow-up sample. School leavers (dropouts, transfers, early graduates) were retained in the sample at an overall rate of about 50 percent. Survey representatives conducted interviewing activities between February and June of 1982. Students still enrolled in base year schools were resurveyed and retested in school sessions. School administrators were asked to fill out a follow-up school questionnaire. Information was also collected on the schools' course offerings and enrollments for the 1981-1982 academic year. School leavers were invited to group sessions at public facilities, where they were reinterviewed and retested. More than 95 percent of those students still enrolled in base year schools and over 90 percent of the school leavers participated in the first follow-up. In the fall of 1982, high school transcripts were collected for a sample of 18,500 members of the 1980 sophomore cohort. Selected transcript data were merged with student questionnaire and test data in a public-use tape for the Sophomore Cohort Data File released in July 1983. A weighted data file of student transcripts and a course offerings and enrollments data file has also been released.

Data

Base year student questionnaires obtained information about students' current educational experiences (programs, course enrollments, grades, etc.), work experiences, educational and occupational aspirations, and a variety of personal and family background characteris-

tics. The first follow-up questionnaire for the younger cohort was essentially the same as that used for the older cohort in the base year. Cognitive tests differed for the two cohorts. Senior cohort tests covered vocabulary, reading, math, picture-number combinations and mosaic combinations. These tests were very close, but not identical, to tests taken by members of the National Longitudinal Study of High School Class of 1972. Sophomore cohort tests covered vocabulary, reading, math (two sections), science, writing and civic education. In the first follow-up, members of the sophomore cohort took the same tests used in the base year.

The first follow-up senior cohort questionnaire collected extensive data on respondents' educational and occupational histories since leaving high school. It also included items on family formation and other personal and family characteristics.

Base year school questionnaires included items on basic school characteristics (total enrollment, grade span, programs and courses offered, facilities and faculty), as well as items on school processes and outcomes (percent who graduate, go on to postsecondary education, drop out, etc.) and student body characteristics (percent minority, percent handicapped, etc.), and a limited amount of data on school finance. The first follow-up school questionnaire repeated many of the base year measures and also explored in detail school procedures for maintaining discipline and order.

In the first follow-up, course offerings and enrollments for the 1981-1982 academic year were collected from participating schools.

Data collected from high school transcripts included courses taken, grades, credits, standardized tests scores, program of study, rank in class, grade point average and days of absence.

This report is one of several analyzing High School and Beyond base year and first follow-up data. HS&B was designed to be relevant both to many policy issues and to many fundamental questions concerning youth development and educational institutions. It is intended to be analyzed by a wide range of users, from those with immediate policy concerns to those with interests in more fundamental or long-range questions.

As succeeding waves of data on a subsample of these students become available (at approximately 2-year intervals), the richness of the dataset, and the scope of questions that can be studied through it, will expand. In addition, use of the data in conjunction with NCES' study of the cohort of 1972 seniors (also available from NCES), for which data at five time points are now available, enriches the set of questions that can be studied.

The data are available on computer tape for a nominal fee from:

National Center for Education Statistics
U.S. Department of Education
1200 19th Street, N.W.
Washington, D.C. 20208-1401

Phone: (202) 254-7361

Attn: Data Systems Branch

For further information about the High School and Beyond survey, contact David A. Sweet at the address above, or call (202) 254-7230.

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Executive Summary

The problems faced by handicapped students in American elementary and secondary schools have become a major object of public concern over the past decade as a result, in part, of the debate surrounding passage of Public Law 94-142. Current discussion centers on two major research issues. The first concerns the extent to, and ways in which, recently enacted legal mandates are being carried out by various State and local educational authorities. The second issue concerns the educational experiences of handicapped students. Many of the questions concerning the quality of education for these students center around the transition from school to work or to postsecondary education. It is clear that such issues could be directly addressed with longitudinal data.

A longitudinal data set such as High School and Beyond, a national sample of all sophomores and seniors in public and private high schools in 1980, would be a valuable source for information about mainstreamed handicapped students if those students were reliably identified. In this report, we assess the identification of handicapped students in the HS&B data set and the utility of the data for studying handicapped high school students.

Students were asked (in self-administered questionnaires) whether they had any of seven specific handicaps (e.g., deafness, or orthopedic handicap); whether they had a condition that limited the kinds or amount of work or education they can get; and whether they had participated in special programs for the physically or educationally handicapped. We used a combined measure (any one positive response) as our handicapped indicator. Were we to have used the 1980 data alone, we would have estimated that 12 percent of the senior and 16 percent of the sophomore cohorts were handicapped. Based on the first follow-up data, collected in 1982, we would have estimated that 12 percent of the senior cohort and 18 percent of the sophomore cohort were handicapped.

Using the reports of students at both points in time, we would estimate the percentage of continuously handicapped students as 4 percent for the senior cohort and 6 percent for the sophomore. The inconsistency between student responses in 1980 and 1982 would be disappointing if one considers "handicapped" to be a permanent category or a stable trait. Seventeen percent of the senior cohort and 22 percent of the sophomore cohort answered inconsistently.

Should we assume that the instability of the data between 1980 and 1982 reflects mainly classification error? Every data element contains some number of errors, and these errors would be particularly evident in reports of rare events. There is ample evidence that even professionals are not able to classify such rare events without ambiguity. Error may be the most parsimonious explanation, but it may not be the correct one.

Our alternative explanation is that students view themselves as handicapped or limited depending on many factors in their lives. Some students have conditions that they will always report (for example, deafness). Other students have conditions that may or may not be viewed as handicaps (for example, minor orthopedic anomalies). "Handicapped" for many students may be a state (that is, transitory and depending on various factors) as opposed to a trait (that is, permanent, part of the continuing self-image). We would expect incidence and prevalence to vary over time, with people moving out of, as well as into, the handicapped state. We would expect self-reports to change over time, and we would expect other student responses in the data to vary in predictable ways with these changes.

To test this theory and to assess data quality, we explored student self-identification as handicapped as it related to various measures. Two measures seemed to be particularly clear and "hard" in the sense of being devoid of errors of interpretation. The first of these were the scores on the HS&B cognitive tests. (We are not concerned here about what those tests may in fact measure, but only with differences in scores.) The second is whether or not the student was still in school in 1982. A third, self-reported grades, was less specifically a hard measure, but was one that seemed a reasonable indicator of how the student was doing in school. The differences on these measures are all in the direction that supports the hypothesis that self-reported handicap status is associated with real differences among students.

We also looked at scores on three psychological scales in the HS&B data set: the locus of control, self-esteem, and the Bradburn Affect Balance scales. Scores on each of the scales fell into the pattern predicted. Students who reported that they were handicapped at both points in time have less sense of control of their own lives, lower self-esteem and fewer positive experiences than the non-handicapped. Students who reported that they were handicapped in 1980 had lower scores than those students who did not consider themselves handi-

capped at the time the psychological scales were administered. Nonetheless, the group who would 2 years later report that they were handicapped had scores below the non-handicapped group. Thus, all differences support our hypothesis.

The HS&B data set also includes teacher identifications of students as handicapped. We used combined teacher and student identifications to construct a second indicator of handicap status. Those students identified by teachers as handicapped in 1980 were likely to have poor test scores and were more likely to drop out of school by 1982.

Analysis of the teacher/student and the student/student variables indicates that both merit further study. Student self-identification as handicapped, previously thought to be of dubious value, proves to be a strong variable. Even conservative researchers would consider those students who identified themselves as handicapped both years to be a population of mainstreamed handicapped students. The ephemeral reports, given in one or the other year but not both, seem on the basis of the evidence examined to be associated with borderline handicaps that are reported partly dependent on the student's general psychological state at the time. Those students too merit further study.

Students who identified themselves as handicapped, or who were so identified by teachers, had various kinds of difficulties in high school. More research is needed to understand the high school and subsequent experiences of these students so that ameliorative strategies and programs can be developed. In the future, new programs could provide such students a better chance for a successful high school experience.

Chapter 1

Definitions of Handicapped and Estimates of the Service Population

The problem faced by handicapped students in American elementary and secondary schools have become a major object of public concern over the past decade. Current discussion centers on two major research issues. The first concerns the extent to, and ways in which, recently enacted legal mandates are in fact being carried out by various State and local educational authorities. Some parties have claimed that substantial numbers of handicapped students remain unserved or under-served, and have advanced various hypotheses as to why. The inadequate local provision for the special needs of handicapped students is reported to be particularly acute at the secondary level. However, little systematic evidence on this issue is currently available. The second issue concerns the educational experiences of handicapped students and, more specifically, the qualilty of these experiences. Many of the questions concerning quality focus on transition from school to work or to postsecondary education. It is clear that both issues can be directly addressed with longitudinal data of the kind available in High School and Beyond.

Using self-reports by high school students to identify a handicapped population has been presumed to be an ineffective strategy. Only psychologists, special education teachers, physicians, audiologists, and similar professionals are presumed to be able to identify the handicapped. It is unarguable that a longitudinal data set such as High School and Beyond, would be a valuable source of information about mainstreamed handicapped students if those students were reliably identified. One task of this report is to assess how well the HS&B data set identifies handicapped students and how useful these data are for studying handicapped high school students.

Definitions of Handicapped Students

Recent work in the sociology of education has argued that, despite the apparent lack of ambiguity that surrounds ordinary usage of the term "handicap," the referents of the term, in fact, vary considerably across social time and place (Carrier 1983). This variability stems in large part from the fact that the idea of a "handicap" is inevitably employed in reference to an individual's functioning within a given social system. A physical, mental, or emotional condition that serves to limit an individual in one context may prove inconsequential in another. The effort to establish a single general definition of what conditions constitute handicaps is hazardous, even when one is concerned with identifying handicapped individuals within a limited sphere of social life such as American high schools. In spite of these ambiguities, efforts have been made in recent years to establish working definitions of handicaps in order to facilitate the provision of special services to the handicapped population in our schools.

A number of laws have been passed that seek to establish the rights of handicapped elementary and secondary school-aged pupils, and to make it easier to provide the services they need. The most comprehensive of these laws is Public Law 94-142, the "Education for All Handicapped Children Act," signed in 1975. The two most important mandates of PL 94-142 are that local educational authorities must (1) provide "special education and related services" to all students who are identified as handicapped, and (2) place such students in the educationally "least restrictive environment" possible. The first provision is intended to have the effect of bringing students formerly excluded by their handicaps into the system, and addressing their special educational needs with unprecedented rigor. The second provision is intended to complement the special services with maximal participation by handicapped students in the schools' regular curricular activities. PL 94-142 distinguishes and defines 11 types of handicaps: deaf, deaf-blind, hard of hearing, mentally retarded, multihandicapped, orthopedically impaired, other health impaired, seriously emotionally disturbed, specific learning disability, speech impaired, and visually handicapped.

The PL 94-142 definitional guidelines require that the relationship between the conditions it specifies and "educational performance" be established in order for a student to be classified as handicapped. The responsibility for establishing these relationships is delegated to State and local educational authorities. The Federal guidelines stipulate that a multidisciplinary team of learning and development specialists evaluate the problems and needs of children who may be handicapped and develop an individualized educational program (IEP) for those found to be so. State education authorities are required to develop plans to assure that all eligible children receive an appropriate public education and to describe how these plans will be implemented. State plans must be approved by the U.S. Department of Education's Office of Special Education and Rehabilitative Services (OSERS) before the State can receive Federal funding.

Despite the uniformity that one might expect the legal and administrative mechanisms to effect in terms of definitions and subsequent treatments of pupil handicaps, considerable variability exists in practice both among and within States. Indirect evidence of variability is found in the fact that States differ substantially in the proportions of their students classified as handicapped and in the proportions with various types of handicaps. These differences are evident in data collected by OSERS on the numbers of students enrolled in special education programs in accordance with PL 94-142 directives. The data indicate that the percentages of students with handicaps ranged from a low of 4.8 percent in New Hampshire to a high of 10.6 percent in Utah for the 1980-81 school year (GAO 1981:44). In some States, similar variations were found between school districts (GAO 1981:45).

While some of this State and local variability is due to differences in the relative sizes of the actual handicapped populations, a large part may be due to differences in either formal or practical definitional criteria, or both. A limited body of research suggests that formal definition differences are most frequently found for the "seriously emotionally disturbed" and "specific learning disabled" categories, while definitional rules are generally quite uniform for the other types of handicaps (Brewer and Kakalik 1979: ch. 5). In particular, many localities evidently tend to classify students who prove to be discipline problems as emotionally disturbed, while ignoring disturbed individuals who are not disruptive. The learning disabled category, in contrast, appears to be defined in widely divergent fashions across school districts, resulting in the inclusion of many students who have other types of handicaps or learning problems not due to a handicap condition (Shepard, Smith, and Vojir 1983, Ysseldyke and Algozzine 1981, Tucker 1980).

Even when there is consensus on the formal definition of a given type of handicap, practical constraints may cause school systems to introduce variability in the application of the agreed-upon rules. Frequently mentioned examples of such constraints are the adequacy of diagnostic facilities, the numbers and training of special educational staff, and adequacy of treatment programs. Variations in these elements can have the effect of expanding or contracting the handicapped category, leading to differences among schools and school systems in the characteristics of students who are included in the definition for treatment purposes. Some evidence indicates that these problems tend to be most pronounced in local school systems with smaller enrollments. Weber and Rosoff (1980) suggest that State and Federal funding provisions tend to necessitate economies of scale that only larger districts, with their absolutely larger number of handicapped pupils, can realize.

The Distribution of Handicapped Students

Three types of estimates are frequently encountered that refer to the distribution of handicapped individuals in the school-age population: the service population, incidence, and prevalence. In the context of the secondary school-age cohorts, the service population figures represent the numbers of handicapped high school students actually receiving special education of one form or another. In contrast, incidence rates refer to secondary-age students who are, have been or will be handicapped at some time in the course of their high school careers. By allowing for the fact that some individuals pass in and out of the handicapped status over time, incidence rates are distinguished from prevalence rates, which refer to the numbers of individuals who have a handicap at a particular point in time.

The September 1981 General Accounting Office (GAO) report, Disparities Still Exist in Who Gets Special Education, provides a useful summary and critical review of the major efforts to collect data about the handicapped, school-aged population. The following discussion draws on that work. The GAO report finds that, of the three accounting categories, data are most adequate for the service population. Statistics on the numbers of students with each type of handicap with breakdowns by age group (ages 3-5, 6-17, and 18-21) are compiled annually by the chief education authorities in each of the 50 States and passed on to the Education Department (ED) Office of Special Education (OSERS) as a requirement of PL 94-142 funding. The Education Department (ED) Office for Civil Rights (OCR) also collects data on the numbers of students served as part of

its biennial survey of local elementary and secondary school districts, but it does not provide national or State summaries with age or level-of-schooling breakdowns.

The OCR survey from fall 1980 estimates that 8.3 percent of the Nation's 41.2 million public elementary and secondary students are classified as handicapped by local school officials (NCES 1983: table 1.6). Of this 8.3 percent, OCR data indicate that about 95 percent of the handicapped students, or 7.9 percent of the student population, are served by special programs (NCES 1982: tables 2 and 33). The estimated 8.3 prevalence rate may be too low as a result of pro forma reporting on the part of local school officials (i.e., keeping the prevalence rate close to the service rate in order to appear in compliance with federal law). While the GAO (1981) report indicates that OCR and OSE* estimates have substantially disagreed, our review finds that since 1980, the OCR estimates of numbers served appear to match the OSE counts reasonably well.

The most detailed picture available to date of the secondary-school-age service population of handicapped students is provided by data from the National Survey of Individualized Education Programs conducted by Research Triangle Institute (RTI) in early 1979. This survey employed a two-stage cluster design, starting with the selection of 208 public school districts, then 507 schools within these districts, and finally 2,657 handicapped students within those schools (Pyecha 1980, reported in GAO 1981).

The RTI survey found that the older the age group, the smaller the proportion of students receiving individualized education programs (IEPS). Approximately 53 percent of the population of handicapped students served by public schools were enrolled in grades 1-6, while only about 29 percent of this population were found in grades 7-12 (Pyecha 1980, reported in GAO 1981: 28-29). Of the remaining 18 percent, 4 percent were pre-kindergarten or kindergarten and 18 percent were ungraded or unclassified. In conjunction with additional published statistics, the RTI figures indicate that approximately 706,100 high-school-age public school students were identified as handicapped in terms of PL 94-142 in the 1978-79 school year. Using an NCES estimate of 13,694,233 public school students in grades 9-12 for the 1978-79 school year (NCES 1982: Table 32), this means that only about 5 percent of the public high school population was treated as handicapped (provided IEPS) in the 1978-79 school year. Carrying out comparable calculations for the K-8 grade levels indicate, in contrast, that 8 percent of this segment was identified as handicapped during that school year. Most of this difference may be accounted for by seriously handicapped students who leave school before entering 9th grade. In addition, some children overcome handicaps with age, corrective treatment, or both. Finally, the secondary school system may fail to identify, and therefore provide appropriate services for, a substantial proportion of the handicapped population which it enrolls.

*Office of Special Education, part of the Office of Special Education and Rehabilitative Services, U.S. Department of Education.

Table 1.1. — Distribution of students aged 3-21 served in special programs, by type of handicap: 1980-81 school year.

Type of handicap	Percent of handicapped population
Total	100.0
Learning disabled	36.0
Speech impaired	30.0
Mentally retarded	19.0
Emotionally disturbed	8.0
Other health impaired	2.6
Multihandicapped	1.5
Orthopedically impaired	1.4
Deaf and hard of hearing	1.4
Visually handicapped	0.6
Deaf-blind	Less than 0.1

Source: U.S. General Accounting Office, Disparities Still Exist in Who Gets Special Education, report to Congress, September 1981, p. 36.

Estimates of both handicap prevalence and incidence are currently unavailable specifically for the high-school-age population.

Distribution of Service Population by Specific Handicap

The OSE child count data and the OCR surveys each provide breakdowns of the combined elementary and secondary handicapped service population by type of handicap. As table 1.1 indicates, the categories of learning disabled, speech impaired, mentally retarded (including both "educable" and "trainable"), and emotionally disturbed, together accounted for over 80 percent of this population in the 1980-81 school year.

Distribution of Service Population by Sex and Race/Ethnicity

Two breakdowns of special interest are the proportions of the handicapped service population that are male and female and the proportions from the major racial/ethnic groups. The RTI and the OCR surveys both provide these breakdowns, but once again only for the combined elementary and secondary populations.

Table 1.2. — Distribution of elementary and secondary students served in special programs by type of handicap and sex: Fall 1978

Type of handicap	Percent male	Percent female
Educable mentally retarded	59	41
Trainable mentally retarded	57	43
Emotionally disturbed	76	24
Learning disabled	72	28
Speech impaired	62	38

Source: U.S. General Accounting Office, Disparities Still Exist in Who Gets Special Education, report to Congress, September 1981, p. 64.

With respect to the special education enrollments of males and females, the two surveys are in close agreement: males are classified and treated as handicapped at about twice the rate of females. For the 1978-79 school year, males comprised about 64 percent and females about 36 percent of the handicapped service population aged 3-21 (GAO 1981:30). The OCR data indicate that sex differences are especially high for certain handicaps, as table 1.2 shows.

The OCR data also indicate that rates of handicap conditions vary by racial/ethnic group. The first row of table 1.3 shows that blacks, American Indians, and Alaskan Natives tend to have the highest rates of participation in special education programs, while Americans of Asian/Pacific Island origin exhibit the lowest rate.

As was also true of the male-female comparisons, the race/ethnic groups contrast in terms of how the handicapped members of their population are distributed across the specific types of handicaps. For example, handicapped blacks are far more likely than the handicapped of the other groups to be classified as "educable mentally retarded," and much less likely to be classified as "learning disabled" or "speech impaired" (GAO 1981: 62).

Little is known or even hypothesized about why the rates of handicap vary by sex and race/ethnicity. Public Law 91-142 explicitly directed that handicaps be defined in ways that will not result in disproportionate representation of different cultural and socioeconomic groups in programs for the handicapped. However, it is possible that the identification and placement processes are frequently biased. It is also possible, of course, that factors associated with sex and race/ethnicity actually function to produce the differential prevalence rates of handicaps observed here.

We have shown that differences in either practical or definitional criteria exist among States, and that professionals (such as pediatricians) or other involved parties such as parents or teachers do not necessarily agree about whether or not a given child is handicapped. The High School and Beyond data allow us to look at the consistency of students' self identifications at two points in time (1980 and 1982) and the agreement between judgements of teachers' and students, self reports. We will evaluate these data as a basis for establishing new estimates of the incidence and prevalence of handicaps among students enrolled in public and private high schools.

Table 1.3. — Relative participation in special education, by race/ethnicity: 1978-79 school year

Participation rate	Race/ethnicity				
	White	Black	Hispanic	American Indian/ Alaskan Native	Asian/Pacific Islander
Participation rate in special education (percents of student populations)	5.9	8.4	5.8	7.5	3.7

Source: U.S. General Accounting Office, Disparities Still Exist in Who Gets Special Education, report to Congress, September 1981, p. 34.

Chapter 2

Data Sources and Prevalence Estimates

In this chapter we will discuss the High School and Beyond data set, and consider the plausibility of using High School and Beyond data to study handicapped students in regular schools. We will review other data sets containing information about handicapped school-aged young people and compare prevalence estimates from these data sources.

The High School and Beyond Data Set

The mandate of the National Center for Education Statistics (NCES) includes the responsibility to "collect and disseminate statistics and other data related to education in the United States" and to "conduct and publish reports on specific analyses of the meaning of significance of such statistics" (Education Amendments of 1974 — Public Law 93-380, Title V, Section 501, amending Part A of the General Education Provisions Act).

Consistent with this mandate and in response to the need for policy-relevant, time-series data on nationally representative sample of high school students, NCES instituted the National Longitudinal Studies (NLS) a continuing long-term project. The general aim of the NLS program is to study longitudinally the educational, vocational, and personal development of high school students and the personal, familial, social, institutional and cultural factors that may affect that development. The NLS program consists of two major studies: The National Longitudinal Study of the High School Class of 1972 (NLS-72) and High School and Beyond (HS&B).

High School and Beyond was designed to guide Federal and State policy in the decade of the 1980's. The survey began in 1980 with the collection of base year data on high school seniors and sophomores. The first follow-up study was conducted in the spring of 1982, and the second in the spring of 1984.

The base year survey was conducted in the spring of 1980. The study design included a highly stratified national probability sample of over 1,100 secondary schools as the first stage units of selection. In the second stage, 36 seniors and 36 sophomores were selected per school (in schools with fewer than 36 in either of these groups, all eligible students were included). Over 30,000 sophomores and 28,000 seniors enrolled in 1,015 public and private high schools across the country participated in the base year survey. Detailed information about the samples can be found in the HS&B sample design report for the base year.

The High School and Beyond data set is not free of the kinds of constraints that limit the utility of other data sets for studying the experiences of handicapped young people.

There are three details of the sampling scheme for High School and Beyond that limit the definition of handicapped students in the data. First, the student population for the survey was defined as students who were enrolled in a high school program leading to graduation and a diploma. This eliminated from the sampling frame all students who were in non-degree programs (leading, for example, to attendance certificates) and thereby eliminated one subset of students often included in definitions of the handicapped. Second, although attempts were made to accommodate such problems, most students had to be able to read and to fill out the questionnaire themselves. Thus, a second subset—of, for example, blind students or those who had difficulty using pencils—were also largely excluded.

Third, because NCES was concerned that no students be made uncomfortable or unhappy by participating, any students drawn into the sample who were considered by teachers to be at risk were also excluded. This may have eliminated some of the students with emotional or mental handicaps.

Thus, student sampling began with students in regular high schools and working toward high school diplomas. The estimated 39,000 secondary school students in residential schools for exceptional students (p. 8, Digest Ed Stat 1982) were not eligible for the sample. This is also true of the multihandicapped, trainable mentally retarded, and seriously emotionally disturbed who are enrolled full time in special education programs not leading to a diploma.

The handicapped students in the High School and Beyond data have passed many hurdles and made it into degree programs in regular high schools. They are likely to be mainly students with slight handicaps. Definitional problems also exist, beyond those of differentiating, for example, the hard of hearing from the deaf. In the preceding chapter we showed the ambiguity of the word handicap in ordinary usage and the variability that exists between States in formal or practical definitional criteria as evidenced by incidence rates. We showed differences among professionals in applying the criteria to identify handicapped students.

There is no general agreement on the overall definition of handicapped young people. One definition, advanced by Brewer and Kakalik is "young people from 0 to 21 years of age who are physically or mentally impaired to the degree that they need services not required by 'normal youth.' " But even this is open to discussion. How is one to define need? Brewer and Kakalik go on to specify (using the terminology of PL 94-142) that they are concerned with "people who are generally called hearing or vision impaired, speech impaired, emotionally disturbed, mentally retarded, crippled or otherwise health impaired, learning disabled and multiple handicapped." They exclude from the definition "youth whose problems are attributable more to social conditions than to physical or mental disabilities, such as 'disadvantaged youth.' "

These puzzling definitional questions, which are often discussed but not resolved in essays, were resolved in the heads of 58,000 high school students in the spring of 1980. These students were asked:

Do you have any of the following conditions? (MARK ALL THAT APPLY)

a. Specific learning disability
b. Visual handicap
c. Hard of hearing
d. Deafness
e. Speech disability
f. Orthopedic handicap
g. Other health impairment

It is obvious that there is no place for the student who is not handicapped to answer the question. Since the respondents had been requested to answer every question, some were presented with a dilemma. We assumed that the overindications of visual problems and other health impairments in the base year were partly a function of this dilemma.

For the first follow-up, the question was revised to:

Do you have any of the following conditions? (MARK ALL THAT APPLY)

a. Specific learning disability
b. Visual handicap (not corrected by glasses)
c. Hard of hearing
d. Deafness
e. Speech disability
f. Orthopedic handicap
g. Other physical disability or handicap (DESCRIBE)
h. None of these conditions

What has been "visual handicap" became "visual handicap (not corrected by glasses)" and "other health impairment" became "other physical disability or handicap." Students were also given the option "none of these conditions." In all of the administrations of the questionnaire, students were also asked:

Do you feel that you have a physical condition that limits the kind or amount of work you can do on a job, or affects your chances for more education? (MARK ONE)

No
Yes

The senior cohort in 1980 and the sophomore cohort in both 1980 and 1982 were asked whether they had been in a special program for the physically handicapped. (In 1982, "In your junior or senior year have you been . . ." was specified to discourage double reporting.) Finally, both cohorts (as seniors) were asked whether they planned to use Division of Vocational Rehabilitation Educational Benefits to pay for college. (The senior cohort was asked in 1982 whether they had used such funds).

A handicapped student for this research is defined as any student who reported having a limiting condition or being in a special program for the physically handicapped, or having one of the listed handicaps, or (in the senior year) planning to use Vocational Rehabilitation Educational Benefits for college. In the base-year definitions, reporting a visual handicap or other health impairment was not sufficient to be classified as handicapped. We assumed that students over-reported these vague conditions because there was no place to report that they had no impairments.

We then developed estimates of the prevalence of these self-defined handicaps among high school students using weighted HS&B data. Were we to have used the 1980 data alone, we would have estimated that 11.6 percent of seniors and 15.7 percent of sophomores were handicapped. As soon as the first follow-up data became available, we constructed an analogous variable, using the student reports collected in 1982. Based on the 1982

data alone, we would have estimated that 12.4 percent of the senior cohort, and 18.1 percent of the sophomore cohort were handicapped.

At this point, since we now had data collected at two points in time, we were able to check the stability of student reports to estimate something similar to test-retest reliability of self-reports of a handicap. Using only the self-confirmed student reports (students who were included in our definition of handicapped in 1980 and again in 1982), we estimated the percentage of continuously handicapped students to be 3.5 percent for seniors and 6.0 percent for sophomores.

The student inconsistency between 1980 and 1982 was disappointing if one considers "handicapped" to be a permanent category or a stable trait. Seventeen percent of the senior cohort and 22 percent of the sophomore cohort answered inconsistently. (This will be explored in more detail in a later section of this report.)

Table 2.1. — Proportion of sophomores and seniors self-identified as handicapped/limited in 1980, 1982 or both (weighted)

Condition	Sophomore cohort	
	1982 handicapped/ limited	1982 not handicapped/ limited
1980 handicapped	6.0	12.1
1980 not handicapped	9.8	72.1

Condition	Senior cohort	
	1982 handicapped/ limited	1982 not handicapped/ limited
1980 handicapped	3.5	8.9
1980 not handicapped	8.1	79.5

It is also possible to use High School and Beyond student reports to estimate the prevalence of specific handicap conditions (table 2.2). We have included estimates from the literature for rough comparison, although the reference age groups are in no case precisely the same as the age group in High School and Beyond.

We could be very conservative and assume that almost all students who meet official definitions of handicapped are given assistance in special programs for the physically or educationally handicapped. If this were the case, and if we chose to rely on student self-reports of having been in such programs, we would estimate that 3.3 percent of sophomores and 3.7 percent of seniors were physically handicapped, and that 3.6 percent of sophomores and 4.0 percent of seniors were educationally handicapped. (These are weighted percentages from 1980.) Since some students may have been in both kinds of programs, we looked at a crosstabulation; and using the non-duplicated percentage, we found that 4.4 percent of sophomores and 4.8 percent of seniors had been in school programs for the physically or educationally handicapped. The students who were in such programs actually did meet a social definition of handicapped and represented one segment of the secondary school handicapped population being served by the schools. Epstein et al., however, estimate that about 50 percent of speech impaired, learning disabled, and deaf; about 40 percent of hearing impaired; about 33 percent of crippled; and about 25 percent of partially sighted secondary school pupils received special instruction/assistance in school.

Data were also collected from the principals (or their designates) in the 1,015 schools in the HS&B sample. Their questionnaire included questions about how many of their students were handicapped, and how students with various kinds of handicaps were accommodated in their schools. The answers about the prevalence of handicaps ranged from 0 percent handicapped to 9.4 percent; the mean was 4.0 percent.

Data were also collected from classroom teachers in the HS&B sample high schools. The teachers provided an estimate of the proportion of secondary school students who had physical or emotional handicaps that interfered with their school work. One or more teachers identified 18.7 percent of seniors and 22.6 percent of sophomores as handicapped. A subsequent section of this report will be devoted to a fuller discussion of teacher ratings.

Other Recent Data Sets

In addition to High School & Beyond, three other recent data sets contain information about handicapped or disabled young people from which prevalence estimates might be made. These are the Department of Labor's National Longitudinal Survey of Labor Force

Table 2.2. — Estimates of the prevalence of specific handicaps from High School and Beyond data and other sources

Handicap	High School & Beyond (weighted percentages)						SRI Validation Study (school children ages 6-17)	Brewer and Kakalik (simple average of estimates in table 5.2)	Gearheart and Weishahn (children ages 5 to 18)
	Sophomores			Seniors					
	1980	1982	Both years	1980	1982	Both years			
	(percentages)								
Hearing impaired	2.21	1.84	0.74	1.70	1.17	0.56	0.3 to 0.5	0.590	0.5 to 0.7
Deaf	0.42	0.45	0.07	0.37	0.35	0.08	0.075 to 0.19	(.08 to 2.10)	
Speech impaired	1.61	1.10	0.32	0.93	0.93	0.29	2.4 to 4.0	4.01 (1.3 to 5.0)	3.0 to 4.0
Visually handicapped	1.59	1.52	0.17	1.30	1.30	0.07	0.05 to 0.16	.042 (.02 to .35)	0.1 (includes blind)
Orthopedically impaired	1.31	0.92	0.23	1.34	0.88	0.33	0.1 to 0.75	.395 (.028 to 1.00)	(crippled & 0.5 other health impaired)
Other health impaired	1.95	2.57	0.30	1.71	2.91	0.45	0.1 to 0.75	.51 (.05 to 1.0)	
Specific learning disability	2.63	1.72	0.54	1.67	1.13	0.41	1.0 to 3.0	2.72 (.026 to 7.0) (learning disabled)	2.0 to 3.0 (learning disabled)

Behavior, Youth Cohort (DOL/NLS); the U.S. Census Disability Survey Pretest (Census Pretest); and the National Center for Health Statistics (NCHS) Health Examination Survey.

Mertens and Seitz used the DOL/NLS data to study the labor market experiences of handicapped youth. The DOL/NLS sample is a national probability sample of over 12,500 people aged 14 to 21 in 1979. This analysis, however, was limited to the 5,085 sample members who had been in school after Public Law 94-142 was implemented and for whom school identification information was available. Respondents were defined as handicapped if they reported being prevented from working or limited in the type of work they could do (unless the reason was a temporary condition); or if they had been enrolled in four or more EMR* classes; or if they were in the second percentile or below in a cognitive test in the data set. From this pool, 398 (or 7.8 percent) met the criteria and were identified as handicapped.

The U.S. Census Disability Survey pretest done in 2,000 households in Richmond, Virginia, in 1979, tested an expanded set of disability questions for possible inclusion in the 1980 decennial census. Estimates were made of the percentage of the entire population of Richmond with certain disabilities. (The full census did not include these expanded questions, since funding could not be found.)

The population in the pretest included persons 16 years of age and over, so only slight age overlap exists with the group in High School and Beyond. In the 16-to 24-year-old age group (the closest grouping for which pretest results are reported) 7.2 percent of the population were estimated to have had some limitation. Of these, 5.6 percent had a work or housework disability, 1.6 percent a functional limitation, 1.0 percent a sight limitation (defined as inability to see clearly even with glasses), and 1.0 percent a hearing limitation.

The NCHS Health Examination Survey estimated the prevalence of medically defined conditions among youth (ages 12-17) in 1966-70. Data were collected by direct physical examination, tests and measurements of a national probability sample of non-institutionalized youths 12-17 years old. Medical histories were obtained from the parents of eligible youths. Sample members were then examined by specially trained physicians who gave them standardized physical examinations and reviewed their health habits and history. "On examination, the survey pediatrician found more than one youth out of five . . . to have some illness, deformity, or handicap (primarily physical) affecting normal growth, development, or function—cardiovascular, neurological, musculoskeletal, or other . . . ." (p. 8). These findings of significant abnormal physical conditions showed a consistent relationship to income level of the family. "The proportion found to be abnormal decreased steadily with successively higher income levels." (*Vital and Health Statistics*, p. 25.)

Estimates of the proportion of handicapped young people based on the High School & Beyond data, these three data sets, and some prevalence estimates in the literature are presented in table 2.3. Since population definitions vary, only rough comparisons are possible.

Prevalence estimates based on High School & Beyond student reports are within the bounds of other estimates. It would be reasonable to accept the sophomore 6.0 percent as an estimate of permanent handicap/limitation; to accept the 17 percent (15.7 percent and 18.1 percent) as an estimate of the prevalence of handicap at a given point in time; and it may be equally reasonable to claim that the incidence rate is 27.9 percent (a total of the sophomores who reported at either or both times). All of these percentages are based on weighted data. We will, in the main, study the sophomore cohort, since a higher-than-average proportion of handicapped students drop out of school before the senior year. The sophomore cohort data also include some psychological variables not in the senior questionnaire. We should also remind the reader that sampling exclusions leave only mainstreamed students, preponderantly those with slight handicaps, in our population.

Stability of Identification as Handicapped

Many people are skeptical about relying on self-reports about almost any complex topic, particularly when the information is gathered in a self-administered questionnaire. They would be disinclined to credit estimates based on student self-reports in HS&B. They undoubtedly would be further concerned about the lack of consistency in student reports between 1980 and 1982. What other data sources can we use for estimates, and how stable are those data?

Some of the complexities involved in identifying students with various handicaps can be illustrated by comparing two major sources. Each year, the States are required by the Office of Special Education to count the number of children receiving special education (and related Public Law 94-142 services) on December 1 of that year to set the level of Federal funding. The Office for Civil Rights also collects numbers to assess the compliance of local education authorities with certain civil rights statutes. The OCR sample is one of districts and schools. This survey obtains estimates of the number of children participating in special education programs,

*Educable mentally retarded.

Table 2.3. — Estimates of the prevalence of handicaps in the school-aged population

HIGH SCHOOL & BEYOND DATA		
Seniors' self reports	4	percent (both years weighted); about 12 percent each year
Sophomores' self reports	6	percent (both years weighted); about 17 percent each year
Teachers' reports	19-23	percent have physical or emotional handicaps that interfere with their schoolwork
School officials estimate of proportion of handicapped students	4	percent (range 0 to 9.4 percent)
Self reports of having been in special program for the physically or educationally handicapped	8	percent (Seniors, 1980 weighted)
	7	percent (Sophomores, 1980 weighted)
DOL/NLS (youth ages 14-21)	8	percent limited or educationally handicapped
CENSUS PRETEST (youth ages 16-24)	7	percent have some work or housework disability
HEALTH EXAMINATION SURVEY (youth ages 12-17)	20	percent with illness, deformity or handicap
SRI 1/VALIDATION OF STATE COUNTS (school-age children)	6-14	percent need special education (includes mentally and emotionally handicapped)
Brewer & Kakalik (range of estimates in table 5.2)	9-24	percent (includes mentally and emotionally handicapped)
Gearheart & Weishahn (children ages 5 to 18)	11-15	percent (includes mentally and emotionally handicapped)
OCR (school-age children)	8	percent classified as handicapped
OSE (school-age children)	12	percent need special education

Source: Kaskowitz, D.H., Validation of State Counts of Handicapped Children, reported in General Accounting Office, Comptroller General of the United States, Disparities Still Exist in Who Gets Special Education, report to Congress, September 1981.

Table 2.4. — Comparison of physician and parent ratings of youth's current health

Parent rating of youth's health	Percent abnormal on examination
Excellent	16.9
Very Good	19.6
Good	26.8
Fair	45.6
Poor	54.0

Source: Vital and Health Statistics. "Examination and Health History Findings Among Children and Youths, 6-17 Years," National Center for Educational Statistics, Health Resources Administration/Public Health Service, U.S. Department of Health, Education, and Welfare, Series 11, Number 129, November 1973, page 77.

both from the school district and from individual schools within the districts. When 1978-79 data from these two sources were aggregated to the State level, the estimates differed by more than 10 percent in over half the States. In California, the two reporting sources differed by 44 percent; in Ohio by 20 percent; in Rhode Island by 29 percent; and in Tennessee by 26 percent. In 19 States, the two totals differed by 20 percent or more (GAO, p. 119).

Since OCR counts themselves varied, it is not surprising that the OCR and OSERS State counts varied even more, especially since the dates of data collection (and some other details) are different. In some categories the differences were substantial. For example, the OCR estimate of the number of emotionally disturbed students was 50 percent lower than the OSERS count. The OSE and OCR estimates have converged since 1980.

In the Health Examination Survey, specially trained physicians found more than 20 percent of all youths to have "some illness, deformity, or handicap affecting normal growth, development or function." When these standard examinations were replicated by different doctors on the team, 7 percent of the sample were found abnormal in the first exam only; 9 percent were abnormal on the second exam only; and 15 percent were found to be abnormal both times (Vital and Health Statistics, Series 11, No. 129, p. 10).

A comparison of examining doctors' opinions with parents' ratings is presented in table 2.4. We see that there was no close agreement between the parents and the examining physicians. Craig, et al., have pointed out that there is little overlap between the children identified by schools as having sensory or orthopedic handicaps and those identified by doctors on examination.

When Mertens and Seitz contacted schools about the students in the DOL/NLS sample who reported a handicap, or had been enrolled in EMR classes, or scored in the second percentile or lower in a cognitive test, they found that 82 percent had not been considered by the schools to be eligible for individualized instruction programs (IEPS). The handicaps reported by DOL/NLS respondents had not led to educational interventions. Although respondents met the research definition of handicapped or limited in some way, the school did not identify them as handicapped. IEPS were provided for 54 (14 percent) of these students, and another 19 (.048 percent) were identified as eligible for IEPS, although none were provided.

The Census pretest design involved a reinterview of 17 percent of the original cases. Data on the stability of reports of visual and hearing disabilities are presented in table 2.5 below. The information is given for a broad age range (16 to 64), and one would expect some increase in hearing and visual difficulties at the upper end of that range.

Table 2.5. — Stability of reports of disabilities, Census Pretest

Interview	Persons reporting visual disability, ages 16-64	Persons reporting hearing disability, ages 16-64	Persons reporting work disability, ages 16-44
Both interviews	7	10	20
First interview only	9	3	3
Second interview only	20	11	6
Neither interview	394	406	239

J. McNeil, "Factors Affecting the 1980 Census Content and the Effort to Develop a Post Census Disability Service," paper presented at the Annual Meeting of the American Public Health Association, Los Angeles, November 1981.

The pretest sample was drawn on the basis of responses to the 1978 census, and those responses were compared to responses in the 1980 pretest. Information about the work disability category for persons aged 18 to 46 is presented in table 2.6. The time frame is the same as that of HS&B (2 years), although the age group involved differs greatly. McNeil points out that this comparison may involve method variance, since the 1978 data were collected by a mail survey and the 1980 by personal interview.

Table 2.6. — Reports of work disability in 1978 and again in 1980 (ages 18-46)

Responses	Number	Percent
Both 1978 and 1980	2,098	1.86
1978 only	2,504	2.22
1980 only	3,436	3.05
Neither	104,383	92.80

Source: J. McNeil, "Factors Affecting the 1980 Census Content and the Effort to Develop a Post Census Disability Service," paper presented at the Annual Meeting of the American Public Health Association, Los Angeles, November 1981.

Summary and Conclusions

In reviewing the array of estimates of the proportion of young people with various handicaps, we find the estimates to be unstable at the individual level. One reason to make such estimates—and to be concerned about their reliability is because they are used in planning services that may be needed by handicapped students in secondary schools. If we wish to assume that the number of handicapped students is the number already receiving special education services, our problem would be partially solved and we could simply use OSERS counts. But we can make no such assumption. As Meyer, Schmidt and Robinson suggest, few secondary school special education programs exist, and only a small portion of handicapped students in this age group have been identified and served. (There has been growth in this area as districts have tried to comply with PL 94-142.)

One focus of this report is to assess the quality of the High School and Beyond data on handicapped students. How useful would these self-reports be in estimating service needs? Should we assume that the instability of the data between 1980 and 1982 reflects mainly classification error? Every data element contains some number of errors, and these would be particularly evident in reports of rare events. We are dealing with rare events that even professionals are not able to classify without ambiguity. Error may be the most parsimonious explanation, but it may not be the correct one.

An alternate hypothesis is that students view themselves as handicapped or limited depending on many factors in their lives. Some students have conditions that they will always report (for example, deafness). Other students have conditions that may or may not be viewed as handicaps (for example, minor orthopedic anomalies). "Handicapped" may be a state (that is, transitory and dependent on various factors), as opposed to a trait (that is, permanent, part of the permanent self-image). We would expect incidence and prevalence to vary over time, with people moving out of as well as into the handicapped state. We would expect self-reports to change over time.

Gliedman and Roth suggest something similar. "Kakalik . . . probably does not overstate the number of children who, at one time or another while they are growing up, will be perceived as handicapped by peers, parents, professionals, or others who count. Our best guess is that between one-quarter and three-quarters of the children singled out by Kakalik are exposed to prolonged stigma and to discrimination because of a true handicap or an incorrect diagnosis that labels them as handicapped. Of the rest, all but the most seriously retarded and emotionally disturbed live on the border between the world of the handicapped and the world of the able-bodied" (p. 5).

Chapter 3

Stability of Student Reports

In this chapter we will explore the stability of student responses by looking at student reports in 1980 and 1982 and then by using them to classify students into four groups. We will begin by looking at the changes in the distribution of responses from 1980 to 1982 to see whether we can discern any patterns.

If we look at the frequencies with which conditions were reported, we note that reports of each specific condition have decreased. This may be a result of the correction in the questionnaire format. In the 1982 version of the questionnaire, pupils who had no handicap had a place to record that answer. It is also likely that some of the students who had no handicap in 1980 but reported one in 1982 are students who developed a handicap or limitation since 1980. Similarly, some students who reported a handicap in 1980 but not in 1982 may have recovered from the condition they reported in 1980. The grand total included in our combined handicapped variable (made up of students who reported specific conditions, or participation in a program for the handicapped, or planning to use scholarship funds from DVR.* or having a limitation) increased for the sophomore cohort from 4,125 in 1980 to 5,051 in 1982. The grand total for the seniors decreased from 1,485 to 1,419. (It should be pointed out that of those participating in both base year and first follow-up, 1,455 sophomores and 356 seniors were included in our definition for both 1980 and 1982.)

The frequency of reports of each of the specific conditions are presented in table 3.1. In this table, we combined reports of "hard of hearing" and "deaf" because of the unclear boundary between the categories and the probable greater accuracy of the combined report.

If table 3.1 provided our only evidence, we might conclude that students had become better at filling out the questionnaires and were aided by the format revisions, so that fewer of them were misreporting (overreporting) in all categories. But if we look at program participation and reports of limitations (table 3.2), which had no change of format but might give an indication of whatever increase in accuracy 2 years of experience and schooling may bring, we see that an increase is reported.

Table 3.1. — Frequency of reporting specific handicaps in 1980 and 1982

Handicap status	Specific learning disability		Hard of hearing/deaf		Speech impairment		Orthopedic handicap	
	Senior cohort	Soph cohort	Senior cohort	Soph cohort	Senior cohort	Soph cohort	Senior cohort	Soph cohort
Both years	30	126	62	201	34	80	31	55
1980 only	177	590	157	417	108	374	97	299
1982 only	86	357	72	339	73	230	67	173
Neither year	11,702	28,664	11,704	28,780	11,780	29,053	11,800	29,210

*Division of Vocational Rehabilitation, a State agency, found in each State, administers State-Federal vocational rehabilitation programs and funds.

Table 3.2. — Frequency of reporting participation in high school program for handicapped students or limiting conditions (sophomore cohort)

Periods	Program for the physically handicapped	Physical limitation
Both periods	83	348
1980 or before only	757	1,721
1980 and 1982 only	972	1,808
Neither period	27,925	25,860

These reports seem to indicate that something is not right in the lives of these students, something that they blame on some aspect of their physical or social being. Such reports may be ephemeral, but may also be related to the students' general psychological state at a particular point in life.

We may gain insight into the error associated with this variable by looking at students who marked one of the conditions (parts a through g) and also marked part h, "None of these conditions." (Even here, there is a slight ambiguity, since the line immediately above part h is the place to describe other physical disabilities or handicaps. A student might not have any "other disabilities" and mark part h in response to that, not in contradiction to the entire preceding list.)

"Do you have any of the following conditions? (MARK ALL THAT APPLY)

a. Specific Learning Disability
b. Visual Handicap (not corrected by glasses)
c. Hard of Hearing
d. Deafness
e. Speech Disability
f. Orthopedic Handicap
g. Other Physical Disability or Handicap (DESCRIBE)
h. None of These Conditions

The number of students who did this for each listed condition is small (between 5 and 9 seniors each or between 13 and 22 sophomores each). However, it can represent as much as 16 percent of the students reporting a particular handicap, since their numbers are themselves quite small.

We will focus the discussion that follows on the sophomore cohort. There are several reasons for this. First, and most important, this cohort includes students who drop out of school before the senior year. It is estimated that 98.4 percent of all students who enter 5th grade enter 10th grade their sophomore year. Of those who enter 10th grade, 79.8 percent enter 12th grade their senior year. (Figures are for the high school class of 1980. Source: NCES Digest of Education Statistics, 1982, p. 15.) We know, then that the sophomore HS&B cohort represents a higher proportion of their age cohort than does the senior HS&B cohort. Further we know (and will discuss below) that a higher proportion of handicapped students drop out than do non-handicapped students. Thus, the senior HS&B cohort excludes more students of particular concern to this analysis than does the sophomore.

If a student reports having a handicap in both 1980 and again in 1982, we have no problem including that student in our analysis as handicapped. If the student reports not being handicapped in 1980 and again in 1982, we have no problem calling that student not handicapped. But what about students who report a handicap at one point in time and not at the other? How are we to understand those inconsistent groups?

A number of things could have happened. First, the student could have developed a handicapping condition between the two dates—for example, become hard of hearing in that time. Or, conversely, a handicap condition could have gone away; for example, a speech impairment could have been overcome with therapy so that the student correctly reported being handicapped in 1980 and not handicapped in 1982. There is no way to identify such events within our data. Second, either of the responses could be incorrect. A student may have incorrectly reported having a handicap at either time, or the student may have incorrectly failed to report a handicap at one time but not the other. Finally it is possible that the student had a borderline condition which may have seemed to the student to be a handicap at some points in life but not at others. This is the hypothesis we will explore in this chapter. If we find evidence to support this hypothesis, the argument that insists that inconsistent responses are mainly data error will be weakened. Conversely, if we cannot find evidence to support a substantive interpretation of inconsistent responses, the data error argument will be strengthened.

We wished to explore our hypothesis in various ways. Could we show any real differences between students who identify themselves as handicapped an those who do not? Could we show differences between those who called themselves handicapped both in 1980 and 1982, in 1980 only and in 1982 only? Is there any hard evidence that the inconsistent groups differ from each other, and from the other two (consistent) groups?

We selected three measures from the High School and Beyond data set that seemed to offer the greatest

Table 3.3. — Grades so far in high school as reported by sophomores in 1980, by handicap status (weighted percentages)

Handicap status	A & high B	B & high C	C & D and lower
Total	26.8	44.3	28.9
Both years	17.2	40.8	41.9
1980 only	19.6	41.4	39.0
1982 only	23.0	45.5	31.5
Neither year	29.2	44.8	26.1

promise of indicating real events (the "hardest" measures for our purposes) and also measures about which we can make predictions based on our hypothesis about the ranking of our four groups. The three measures are: students' self-reported grades (in 1980), scores on the HS&B base-year cognitive tests, and the proportion of each group who dropped out of school before graduation.

We expect that students who report themselves to be handicapped at both points in time will tend to have the lowest grades and test scores and the highest dropout rate. Those students who called themselves handicapped in 1980 (but not in 1982) will have the next poorest scores on these measures. The grades and test scores are from the same point in time as their self-description as handicapped, so in one sense we might expect them to be the same as the first group on these measures. But by 1982, these students no longer call themselves handicapped and thus are in our "borderline" category. For this reason, we expect their scores to be slightly higher than their handicapped peers. The next group did not consider themselves handicapped in their sophomore year, but did by the time they were seniors. Their "borderline" condition may have produced somewhat poorer scores than the mean of the nonhandicapped, but scores should be above those of students who already called themselves handicapped in 1980.

In table 3.3, we see the percentage of students in each group reporting high, medium, and low grades so far in high school. The grades have been grouped so that about a quarter of the entire sample are in the high (A and high B) and in the low (C and D) groups, and about half of the sample are in the middle category.

The proportion of students reporting grades at each level is in the order we predicted. This does not support the notion that the inconsistent groups simply represent error in the data.

Next we will turn to the HS&B cognitive test scores. (We will not discuss the possible meaning of these scores or what the tests may be measuring.) Members of the sophomore cohort took brief tests of vocabulary, reading, math (two sections), science, writing and civics. (Students were retested using the same instruments in 1982.) Although the test scores exist in the data files in a number of ways, we chose to examine the number of right answers as the most direct indicator. (Using the formula scores would not have altered any statement in the discussion that follows.)

When we look at the handicapped variable which combines student reports about themselves in 1980 and 1982, we find that the means of the groups are in the expected direction on all seven subtests (see table 3.4). Handicapped students who were going to report not being handicapped in 1982 had slightly higher scores on the subtests than other students who continued to report their handicaps. And students who were not handicapped in 1980 nonetheless had slightly lower scores if they were going to report being handicapped in 1982. If

Table 3.4. — Mean number correct on sub-tests by handicap status: sophomore cohort, 1980 (weighted data)

Year handicapped	Vocabulary	Reading	Math 1	Math 2	Science	Writing	Civics
Both years	9.0	7.6	12.0	3.8	9.3	8.3	5.1
1980 only	9.6	8.0	12.6	4.0	9.9	9.0	5.2
1982 only	10.4	8.7	13.8	4.1	10.6	9.8	5.6
Neither year	11.3	9.4	14.8	4.4	11.3	10.7	6.0

inconsistent responses were simply random error, it is surprising that those who were not going to make the error 2 years later have slightly higher test scores than the handicapped, and those who were going to make an error 2 years later had still higher test scores, and that all of these groups had slightly lower test scores than nonhandicapped students.

When the subtests are combined to a total score, we find that the differences persist. The same pattern occurs on subtests and totals for 1982 (table 3.5). The differences are in the direction which supports the hypothesis that students who claim to be handicapped at one (but not both) times have some sort of borderline handicap.

The third indicator we explored was whether or not the student was still in school in 1982. One could predict that students who were handicapped at both points in time would have the highest dropout rate and those handicapped in 1980 but not in 1982 might have the next highest. Some of these students may have felt handicapped in the school situation, but once out of school no longer felt disadvantaged. The students who first reported handicaps in 1982 may have had a somewhat lower dropout rate than the other two groups. We expect that students who did not report handicaps would have the lowest dropout rate of these groups.

About 14 percent (13.6 percent) of all of the students in the HS&B sample (weighted) dropped out of school. The rate for nonhandicapped students is 12.6 percent. Of students who reported they were handicapped in 1980, 18.6 percent left school before graduation. Of those who reported they were handicapped in 1982, 15.3 percent dropped out. In table 3.6, we show the four category handicapped variable that combines reports for the 2 years. The groups are in the order we expected. It is interesting to note that the ephemeral reports of being handicapped in the sophomore year are associated with a dropout rate close to that of the self-confirmed handicapped. In contrast, ephemeral reports in the senior year are associated with a rate close to that of the nonhandicapped mean.

Table 3.6. — Percent of 1980 sophomore cohort who left school before graduation by handicap status (weighted data)

Total	13.6
Handicapped both years	19.1
Handicapped 1980 only	18.3
Handicapped 1982 only	13.2
Handicapped neither year	12.6

The GAO report pointed out that very little information was available about the dropout rates of handicapped students. It also suggested that a high dropout rate among students who had been determined to need special education would raise questions about access to special education in high school. Although the HS&B students may not have been "determined to need special education," they do regard themselves as handicapped in the school and seem to need service beyond that ordinarily provided in high schools.

We might have predicted that these students would have some trouble in high school. About a fifth (19.7) of the students who identified themselves as handicapped in 1980 and 1982 had repeated a grade before 1980. About 13 percent of the inconsistent groups had done so (13.3 percent and 13.4 percent). Approximately 7 percent (7.2) of the nonhandicapped group had repeated a grade. (These are weighted percentages.)

There exists little information on the types of curriculum exposure that handicapped students receive in high school. Alexander and his colleagues (1976, 1979) have consistently documented the importance of curriculum program placement for student achievement and postsecondary education opportunities. Previous research has had limited success in identifying the specific mechanisms through which curriculum placement exerts its influences on school outcomes. However, the most important mechanisms appear to be the differential

Table 3.5 — Mean number right on combined cognitive tests, by handicap status: sophomore cohort, 1980 and 1982

Handicap status	Sum 1980, unweighted	Sum 1980, weighted	Sum 1982, unweighted	Sum 1982, weighted
Both years	62.9	63.3	66.3	66.5
1980 only	66.3	67.0	72.3	72.6
1982 only	72.5	72.4	76.1	78.1
Neither year	78.2	78.3	84.1	84.5

quantity and quality of coursework in various subject areas, and differential patterns of peer group attitudes and orientations.

In table 3.7 we see the program status in 1980 and in 1982 of students who reported being handicapped in each of those years.

Table 3.7. — Program status of students who reported being handicapped (weighted data): sophomore cohort, 1980 and 1982

Condition	General	Academic	Vocational
	Program in 1980		
1980 Handicapped*	46.4	24.3	29.4
1980 Not handicapped	46.3	34.0	19.7
	Program in 1982		
1982 Handicapped	38.1	31.6	30.3
1982 Not Handicapped	34.6	40.2	25.2

*Percentages exceed 100.0 because of rounding.

In the sophomore year, approximately the same proportions of handicapped and nonhandicapped students were in the general program. There were 10 percentage points more handicapped than nonhandicapped in the academic program. By the time they were seniors, still about 10 percentage points fewer handicapped students were in the academic program and about 5 percentage points more in both the general and vocational tracks.

In 1978, Walsh reported two studies that showed that most handicapped students in public and private high schools had virtually no contact with science teaching. If we look at the students in academic programs, we see that this was not the case in our data. About 34 percent (34.1 percent weighted) of handicapped students and 38 percent of nonhandicapped students (38.1 percent) reported taking 3 or more years of science. Although smaller proportions took as much science in general or vocational programs, there was little difference by handicapped status.

Profile of Handicapped Students

Who were the students who identified themselves as handicapped in the 1980 sophomore questionnaire? They were likely to be male (56.3 percent, but only 49.9 percent of the population was male), they were most likely to be white (71.3 percent, but 72.6 percent of the population). Hispanics were somewhat overrepresented (20.5 percent, but 13 percent of the population); blacks were very slightly overrepresented (14.6 percent, as compared to 12.1 percent of the population). Handicapped students were more likely to be from the lowest SES quartile (32.4 percent) and to be getting poor grades (40.1 percent reported getting C's and D's or lower, as compared to 28.9 percent of the population). Finally, they did poorly on the cognitive tests: 41.3 percent of them were in the lowest quartile of the test score distribution. (All of these percentages are weighted.)

By the time the sophomore cohort became seniors, this picture changed somewhat. The sex ratio remained about the same, and only the Hispanics were overrepresented (16.7 percent, as compared to 13 percent in the population). By the time first follow-up data were collected, the students who were having the most trouble with school had left. About the same proportion of nonhandicapped students expected to go to college each year (57 percent in 1980 and 58 percent in 1982), but more handicapped students had this expectation (50 percent, as compared to 44 percent) in 1982 than in 1980 (table 3.8).

From this information alone, we would expect that the handicapped students still in school in 1982 would have more closely resembled the nonhandicapped, that the gaps between the two groups would have been reduced.

Since we know that students who call themselves handicapped are less likely to be in the academic track, it is not surprising that a lower percentage of them plan to go to college. Of the students in the academic track who did not report handicaps, 76 percent planned to go to college; 68 percent of those who reported a handicap in 1982 planned to go to college. Overall, 47 percent of students who are not handicapped planned to go to college no matter what track they were in, and 36.3 percent of students who reported being handicapped planned to do so (table 3.9). Nearly equal proportions of each group planned to go on for some sort of career or vocational training; 34 percent of the nonhandicapped and 41 percent of those who reported being handicapped planned to spend most of their time during the year after high school working. Virtually the same proportion of

Table 3.8. — Percentage of handicapped and nonhandicapped students expecting various levels of subsequent education (weighted sophomore data)

Year and condition	High school or less	Post-secondary vocational	College
	Expectations in 1980		
1980 Handicapped	36.8	19.0	44.2
1980 Not handicapped	25.6	17.3	57.1
	Expectations in 1982		
1982 Handicapped	28.3	21.4	50.2
1982 Not handicapped	21.1	20.8	58.1

students planned to take vocational training the year after high school no matter what their status was on the handicap variable. However, students who planned to go either to college or to work directly after high school followed the same pattern noted before: expectations were lower for the handicapped, higher for the nonhandicapped.

If we limit our consideration to those students in the academic program, we see that the pattern still persists. More nonhandicapped than handicapped students planned to go to college, and any sign of handicap in either year reduced the likelihood that a student was planning to go on to college. When self-identified handicapped students do get to college, Lawrence et al. report, they are somewhat more likely to be of low SES, minorities, somewhat less adequately prepared for college (with lower high school grades and achievement test scores) and more likely to enroll in public 2-year colleges.

Table 3.10. — Percentage of students in the academic track planning to go to college, by handicap status (weighted 1982 data, sophomore cohort)

Handicapped both years	64.4
Handicapped 1980 only	67.7
Handicapped 1982 only	68.4
Not handicapped	76.2

So far, we have shown differences between the four groups of students. Virtually all of them fall into an order or pattern which supports the statement that the classification of students as handicapped by their own (even by their own ephemerial) report relates to differences among the groups. We have seen these differences in three firm measures (grades, cognitive test scores and rate of dropping out of high school), in high school program assignment, in plans for future education, and in a range of other variables, including common demographic measures. It seems safe at this point to conclude that the students who identify themselves as handicapped are indeed indicating that they are having difficulty with their high school experience. Relatively few of them have been in programs for the physically or educationally handicapped (7.0 percent (weighted) of the sophomore cohort have been in one or both kinds of programs. The unduplicated weighted percentage is 4.4). It is an open question whether more such special programs would have helped

Table 3.9. — Percentage of students (all tracks) with plans for how they will spend most of their time the year after high school, by handicap status (weighted 1982 data, sophomore cohort)

Handicap status	College or university	Vocational	Work, including military	Other
Both years	30.9	14.4	45.3	9.4
1980 only	34.6	14.4	42.5	8.5
1982 only	38.8	23.8	38.6	8.9
Not handicapped	47.1	13.0	33.3	6.5

these students. (When we look at the grades and dropout rates of those students who have been in such special programs, we find little evidence that the programs helped either their grades or their school completion. But the students identified by schools and placed in such programs may be the most severely or obviously handicapped. Special programs may have indeed helped them, even if they were only brought to the level of the self-identified handicapped students who were not in such programs.)

We accept that self-identification as handicapped means something about these students, even those ephemeral reports which appear in one year or the other. Most researchers would probably accept students who consistently reported being handicapped as adequately identified. Many aspects of the education of mainstreamed handicapped students could be studied using only this subset of the handicapped students. But how can we better understand the ephemeral reports of the inconsistent groups, beyond whatever number of them may have either become handicapped or have recovered from handicaps between 1980 and 1982?

Throughout this report, we have argued that being handicapped should be considered a transitory state as well as, for some persons, a permanent trait. One basis for this augument has been the inconsistent reports. Students may call themselves handicapped when their lives are not going well or may not report their borderline limitations when things are better. We should be able to find evidence of this pattern in the psychological variables in the HS&B data set.

Measures of Psychological State

Three scales in the sophomore cohort data are the clearest indicators we have of the psychological state of respondents at the time data were collected in 1980. These are a locus-of-control scale, a self-esteem scale and a measure of psychological well-being (the affect-balance scale). The locus-of-control scale purports to measure the respondent's perception of the relationship between his or her own actions and events in his or her life. In the HS&B data, the scale is created from four items (marked B,E,F & G in table 3.11). Internal control—that is, a sense of being able to have some control of your life—is considered to be the high or good end of the scale. The self-esteem score is also a combination of four items (marked A,C,D & H in table 3.11). Higher scores represent higher self-esteem. For these two scales, each component was standardized separately (using the appropriate weights), and scale scores are averages of the noncomponents. Both of these scales were included in both the base-year and first-follow-up instruments for both cohorts. The third scale, the affect-balance scale, involves summing the frequency of negative and positive experiences reported by the respondent, then subtracting the negative from the positive. (The elements of this scale are identified as I through R in table 3.11.) A response of "never" is scored as 1 and a response of "very often" is scored as 5. A constant (15) is added to eliminate negative scores, and the range then becomes 0 to 30. All three of these scales are widely used and have generated large bodies of research literature.

We have noted that reporting a borderline condition as a handicap may reflect a student's general bad feelings or depressed psychological state. In such cases, we would expect that students who reported being handicapped would have lower-scale scores than persons who did not consider themselves handicapped. Further, those with borderline conditions should be arrayed between the other groups. Since the psychological scales were in the 1980 data, we would expect students who reported being handicapped in 1980 to have had lower scores on these scales than the group who reported being handicapped in 1982. This latter group, however, would have lower scores than the nonhandicapped (because, even though they do not report a handicap, they do have a borderline condition). The highest (or best) scores would be those of students who did not report a handicap at either time.

If the two inconsistent groups simply reflect error in the data, we have no hypothesis about the pattern of their responses to these scales.

In addition to the three scales, there were a number of individual items which seemed relevant to the student's psychological state. These are presented as items S through Y in table 3.11. Among these were a series of true/false items about discipline problems and physical appearance, and an item about feeling depressed.

If we look at the figures in table 3.11, we see that virtually all of the responses are in the pattern order our hypothesis led us to predict.

Table 3.11 — Weighted percentage of sophomores responding negatively to attitude items (1980), by handicap status

	Item	Handicapped both years	Handicapped 1980 only	Handicapped 1982 only	Not handicapped
A.	I take a positive attitude toward myself (Disagree)	11.5	10.6	7.7	7.8
B.	Good luck is more important than hard work for success (Agree)	27.8	21.9	16.6	11.3
C.	I feel I am a person of worth on an equal plane with others (Disagree)	12.3	9.2	6.3	5.4
D.	I am able to do things as well as most other people (Disagree)	12.2	10.8	7.2	6.1
E.	Every time I try to get ahead something or somebody stops me (Agree)	42.2	35.6	30.5	23.7
F.	Planning only makes a person unhappy, since plans hardly ever work out anyway (Agree)	31.3	26.4	22.6	18.1
G.	People who accept their condition in life are happier than those who try to change things (Agree)	54.4	49.1	48.6	44.5
H.	On the whole, I am satisfied with myself (Disagree)	23.1	19.5	17.0	16.9
I.	Particularly excited or interested in something? (Never)	8.9	6.8	4.5	3.0
J.	So restless that you couldn't sit long in a chair? (A lot)	15.4	15.7	15.7	13.4
K.	Pleased because someone complimented you on something you had done? (Never)	14.3	14.7	12.3	11.1
L.	Very lonely or remote from other people? (A lot)	11.1	9.2	8.3	6.2
M.	Pleased about having accomplished something? (Never)	10.5	12.6	8.1	6.9
N.	Bored? (A lot)	24.5	24.0	21.5	19.5
O.	On top of the world? (Never)	35.3	36.9	32.8	33.0
P.	Depressed or very unhappy? (A lot)	14.4	11.2	10.1	8.1
Q.	That things were going your way? (Never)	15.0	14.5	10.3	9.6
R.	Upset because someone criticized you? (A lot)	9.8	7.4	5.0	3.6
S.	I have had disciplinary problems in school during the last year (True)	29.7	27.8	21.9	17.3

Table 3.11 — Weighted percentage of sophomores responding negatively to attitude items (1980), by handicap status —Continued

	Item	Handicapped both years	Handicapped 1980 only	Handicapped 1982 only	Not handicapped
T.	I have been suspended or put on probation in school (True)	19.9	17.5	14.6	11.3
U.	I have been in serious trouble with the law (True)	10.8	8.8	5.9	4.6
V.	I am overweight (True)	30.4	24.0	22.4	21.3
W.	Others think of me as physically unattractive (True)	28.4	22.9	18.9	14.6
X.	I am popular with other students in my class (False)	32.4	28.5	24.5	21.4
Y.	During the past month have you felt so sad, or had so many problems that you wondered if anything was worth while? (Yes, more than once)	42.0	37.8	34.7	30.1

If we look at a similar set of comparisons in the first follow-up data, we might expect that the scores of the two middle groups would be closer together. The scores of students who no longer report themselves to be handicapped should be higher, while the scores of the group newly reporting themselves to be handicapped should be relatively lower. Scores of these two inconsistent groups support this notion (table 3.12—base-year figures are in table 3.11). In all 14 of the measures, a smaller percentage of the students who reported themselves handicapped in 1980 but no longer do so gave the downscale response than either their own group or the other inconsistent group did in 1980. In 13 of the 14 measures, the scores moved closer together in 1982, and in 9 of the items (C,D,H,S,T,U,V,W and X) their relative positions actually reversed.

We have now examined a large number of frequency distributions and have found modest evidence to support the notion that being handicapped may be, for a subset of students, a transitory state rather than a permanent trait. We have also found that defining oneself as handicapped may indicate low self-esteem and a somewhat depressed state of mind.

We did a series of simple analyses of variance with the self-identification-as-handicapped variable as the factor (nonmetric independent variable) and the three psychological scales as criterion (dependent) variables. The first two, locus-of-control and self-esteem are averages of the components shown in table 3.11. (Each component was standardized separately.) The affect-balance scale is the difference between frequency of positive and frequency of negative experiences. We present the unweighted results as multiple classification analysis in table 3.13.

Scores on each of the scales are arrayed in the pattern predicted. Students who reported that they were handicapped at both points in time had less sense of control of their own lives, lower self-esteem and fewer positive experiences than the nonhandicapped. Students who reported that they were handicapped in 1980 had lower scores than those students who did not consider themselves handicapped at the time the psychological scales were administered. Nonetheless, the group who would 2 years hence report that they were handicapped had scores below those of the nonhandicapped group. The differences are all statistically significant and in the direction to support our hypothesis. The main effects persist when the effects of race, sex, and socioeconomic status are removed.

Summary and Conclusions

What can we conclude about the student self-identifications? From the psychological variables, we find evidence to support the notion that being handi-

Table 3.12. — Percentage down-scale responses to psychological variables in 1980 and 1982 by students with inconsistent self-identification as handicapped (weighted)

Item	1980 down scale responses		1982 down scale responses	
	Handicapped 1980 only	Handicapped 1982 only	Handicapped 1980 only	Handicapped 1982 only
A. I take a positive attitude toward myself	10.6	7.7	6.6	6.6
B. Good luck is more important than hard work for success	21.9	16.6	16.2	15.0
C. I feel I am a person of worth on an equal plane with others	9.2	6.3	5.1	5.4
D. I am able to do things as well as most other people	10.8	7.2	4.8	5.0
E. Every time I try to get ahead something or somebody stops me	35.6	30.5	28.8	26.8
F. Planning only makes a person unhappy, since plans hardly ever work out anyway	26.4	22.6	22.0	23.0
G. People who accept their condition in life are happier than those who try to change things	49.1	48.6	43.9	43.8
H. On the whole, I am satisfied with myself	19.5	17.0	14.9	15.6
S. I have had disciplinary problems in school during the last year	27.9	21.9	16.1	16.4
T. I have been suspended or put on probation in school	17.5	14.6	17.5*	18.6*
U. I have been in serious trouble with the law	8.8	5.9	5.3	6.3
V. I am overweight	24.0	22.4	20.8	20.9
W. Others think of me as physically unattractive	22.9	18.9	11.9	12.0
X. I am popular with other students in my class (percentage responding FALSE)	28.5	24.5	18.1	19.1

*Academic or disciplinary probation.

Table 3.13. — Self-identification as handicapped and psychological scale scores (unweighted sophomore data)

Handicap status	Number of students	Locus of control 1980	Self-esteem 1980	Affect-balance 1980
Handicapped both years	1,166	−0.27	−0.19	−1.19
Handicapped 1980 only	2,301	− .18	− .12	− .64
Handicapped 1982 only	2,673	− .09	− .02	− .10
Not handicapped	17,544	+ .06	+ .03	+ .18
	F-statistic*	195.04	62.45	63.86
Degree of freedom (numerator)		3	3	3
Within-group standard deviation		.637	.702	4.09

*Statistical test of the hypothesis that group means are equal. This statistic is obtained by dividing the among group mean square by the within group mean square. The larger the F-statistics, the more heterogeneous the groups. The critical value of F with 3 and 22,000 degrees of freedom on the .01 probability level is 2.78.

capped is for some young people a transitory state. Students who have borderline conditions report them as handicaps/limitations when they are feeling unhappy but may not report them when they are in better condition psychologically. Many individual variables and the analysis of variance support this idea.

We have now reviewed the handicapped students identified by self-reports in the High School and Beyond sample. Our "handicapped" variable relies on student responses on whether or not they 1) had been in special programs for the physically handicapped; 2) had certain conditions such as speech or hearing impairments; 3) had a physical condition that limited the amount of work they could do or the education they might acquire; or 4) planned to use college funding from the Division of Vocational Rehabilitation. The self-report variable includes anyone who answered any of these items positively. Parallel self-report variables were created from 1980 and 1982 responses. We used this composite variable since it seemed to offer the best and most inclusive definition in the data. We call these students handicapped or handicapped/limited as a shorthand to indicate that they answered positively to at least one of those specified items in the questionnaire.

We have limited much of our discussion to the sophomore cohort because we know from this data set that a disproportionately high percentage of the handicapped/limited students leave school before their senior year. A higher proportion of the population of interest is in the sophomore cohort. Members of that cohort who dropped out of school were followed up in 1982, as were their peers who were still in high school.

We showed that these students differ on self-reported grades, cognitive test scores and in dropout rates. We then explored the hypothesis that students who answered inconsistently—that is, claimed to be handicapped in one year but not the other—had borderline conditions that they felt to be handicaps when they were unhappy or uncomfortable with aspects of their lives. We hoped to demonstrate the plausibility of this interpretation by analyzing differences in scores on psychological scales and other variables. The differences were all in the direction that would support the hypothesis.

Chapter 4

Teacher Versus Student Identification of Handicaps

The High School and Beyond data contain indications by classroom teachers of whether sample students were handicapped. These data were noted in Chapter 3, where the overall rate of handicapped students using teacher ratings was presented (22.6 percent of the sophomore cohort were identified as handicapped by at least one teacher). Teacher observations are available for about 60 percent of the students in the High School and Beyond sample. (They are available for 14,286 sophomores). Some schools (about 40 percent) were unable to provide any teacher forms. Many of these were schools where data collection was completed very late in the year, and teachers were too busy with end-of-term tasks to complete the forms. In the schools that did participate, teachers were anonymous, so there was no way to check whether individual teachers had responded or to follow up those who had not. The data thus include responses from the most cooperative teachers in a nonrandom subset of schools. Using a set of carefully specified assumptions, Fetters et al. estimate the overall response rate at about 40 percent.

Teachers were asked whether they had had each sample student in class during the previous year. If so, they were asked to answer seven brief questions about these students, including:

PLEASE INDICATE WHETHER THIS STUDENT IN YOUR OPINION:

10. has or may have a physical or emotional handicap that is affecting his or her school work

    Yes
    No
    Don't know

Since all full-time teachers in the sample high schools were asked to fill in comment forms, we have more than one observation for many students, and no teacher observations at all for many other students. In order to resolve the dilemma presented by teacher observations that do not agree (see Fetters), we decided that only students for whom two or more teachers reported would be included in this part of the analysis. Of those teacher reports, a majority had to indicate that the student was handicapped for that student to be included in this variable as teacher-identified-handicapped. (Thus, if there were two reports, both had to indicate handicaps; if three reports, two or more had to agree, and so on.)

Students so identified were taught by the responding teachers during the past school year. Each was a student the teachers "knew" and—for those called handicapped—at least two reporting teachers agreed 'has or may have a physical or emotional handicap that is affecting his or her school work."

The students did not have an opportunity to report that they had emotional handicaps that might affect their school work, except perhaps as a "physical condition that limits the kind or amount of work you can do on a job or your chances for more education." Since the information requested from teachers and students was not parallel, and since "affecting school work" is not part of the student definition of handicap, we would not expect student and teacher reports to overlap precisely, even if there were no reporting error. We developed a teacher observation variable with four categories: teacher- and student-identified as handicapped (+T, +S); teacher-identified only (+T, -S); student-identified only (-T, +S) and neither teacher- nor student-identified (-T, -S). Both teacher and student identifications were from 1980.

This variable differs conceptually from the four-category student variable discussed in the preceding chapter. It is based on responses from the student and at least two additional observers. The observers were asked slightly different questions than the students. But the teacher observations and student self-identification were done at the time (spring of 1980) the dependent variables were collected. The student self-identification variable discussed in the previous chapter was based on information collected from the student in 1980 and 1982.

At least one teacher observation was collected for 14,286 sophomores. If we had simply used the identifications as handicapped by any teacher, we would have had 3,231 students identified as handicapped (22.6 percent of all sophomores in the teacher file). Using our conservative decision rule that two (or a majority of) teachers had to agree that a student was handicapped, 6.8 percent of the students were identified as handicapped. The remaining students identified by only one teacher, or by some but not a majority of teachers, would in this analysis be classified as student-identified (−T, +S) or not handicapped (−T, −S).

Who were the students that teachers reported to be handicapped? Unweighted figures show them to have been disproportionately male (54.3 percent, although 48.0 percent of this sample is male), Hispanic (18.4 of identified students, as compared to 14.2 of this sample) or black (15.6, as compared to 11.5 in this sample). Slightly over half of the students identified by teachers as handicapped (51.4 percent) were in the lowest quartile of HS&B cognitive test scores. About a third of them (35.2 percent) were in the bottom quartile of the HS&B socioeconomic status measure (an average based on a combination of father's occupation, father and mother's education, income and family possessions). The student-identified in this sample were 53.1 percent male, 20.6 percent Hispanic, and 14.2 percent black; 40.6 percent of them were in the lowest quartile of test scores; and 32.5 percent were in the lowest quartile on the SES measure.

The percentage of low-SES students in the self-identified group was only slightly lower than in the teacher-identified group. The work of Neer et al. led us to expect that the difference would be greater. In that research, 31 psychologists were asked to review data for three case studies, identical except for SES. The researchers concluded that labels (in this case, mentally retarded) are not assigned independently of SES.

The Teacher - Student Identification Variables and School Measures

Since Craig et al. and other researchers have shown that teacher identification differs with other methods of identifying handicapped students, we recognize that teachers will not identify all handicaps. And in this instance, teachers were asked to identify only those students whose handicaps interfere with school work. In this section, we will look at the teacher identifications and compare them to those of the students. We will do this by looking at a four-part variable constructed by combining teacher and student identifications. Do the teacher and student combined variables augment our understanding of the possibly handicapped students in this population, or does either rating alone serve just as well?

The third group, student-identified (only), were students with borderline conditions that did not obviously interfere with school work. We expected these students to be near the mean on these outcome measures.

In table 4.1, we show the grades so far in high school as reported by the students in the base year. (We grouped the grades so that about 25 percent of the responses of the entire sample would be in the high and low categories and about half would be in the middle).

The table provides an odd kind of validation for both teacher and student ratings and for the students' probable accuracy in describing their grades. The students identified by teachers as having handicaps that interfered with their schooling tended to report lower grades. Those students identified by the teacher only (the second row of the table) reported the lowest grades. The group that we argue had borderline handicaps was doing less well than the nonhandicapped group. The teacher

Table 4.1 — Self-reported grades, by teacher-student identification of student as handicapped (unweighted sophomore data)

Is student handicapped?		Number of students	Percentage of students reporting		
Teacher	Student		A's and B's	B and C+	C and below
Yes	Yes	292	12.1	35.6	53.8
Yes	No	546	8.6	34.6	56.8
No	Yes	1,486	22.9	41.1	33.0
No	No	10,119	31.4	45.6	22.9

Table 4.2. — Total number right on cognitive tests, 1980 and 1982, by teacher-student identification of student as handicapped (unweighted sophomore data)

Is student handicapped?		Number of students	Total number right		Score change	Percent
Teacher	Student		1980	1982	1980-1982	change
Yes	Yes	289	54.5	57.4	2.9	5.3
Yes	No	534	63.1	67.2	4.1	6.5
No	Yes	1,486	70.1	75.2	5.0	7.2
No	No	10,116	79.8	86.9	7.1	8.9

identification alone indicated a group that was having academic trouble in high school; but those students who identified themselves as handicapped/limited without teacher confirmation were also doing less well than average in high school.

If we look at individual cognitive test scores, we see that all seven subtests in both 1980 and 1982 (14 tests in all) are in the same pattern. This is also true if we look at formula scores. In table 4.2, we present the total scores for both years. As was true of self-reported grades, scores on the cognitive tests were lower for the teacher-identified. But here, those confirmed by the students had the lowest scores. (This was not true of grades.) And students who identified themselves as handicapped were below the mean both years.

In the last column of the table, we see the difference between the 1980 and 1982 cognitive test scores. The students who were considered by neither teachers nor themselves to be handicapped improved the most. The numbers in this column suggest that students who were handicapped in the eyes of teachers in fact learned less in the last 2 years of high school.

Finally, let us see what proportion of each of these groups actually left high school before graduation. By 1982, 237 (or 27.8 percent) of the students identified by teachers as handicapped had dropped out of school. This can be compared to the 6.5 percent of students not identified by teachers as handicapped. If we look at these (but not by themselves) as handicapped, 30.2 percent had left school. Of students who were identified as handicapped by themselves and by teachers, 23.3 percent had left school. (These percentages are unweighted.)

In table 4.3, we look at the percentage of each of these groups that dropped out within each quartile of the HS&B socioeconomic status indicator. The pattern persisted at each level. Higher proportions of the teacher-identified students dropped out. Those students who were self-identified only were close to the mean at every level.

Table 4.3. — Dropout rate, by teacher-student identification of student as handicapped and SES quartile (unweighted sophomore data)

Is student handicapped?		Percent of students in lowest quartile	Dropout rate by SES quartile (1980)			
			Lowest	2	3	4
Teacher	Student					
Yes	Yes	39.2	26.7	25.0	17.2	6.7
Yes	No	33.1	29.3	33.6	20.0	18.0
No	Yes	31.3	13.6	7.4	4.8	2.9
No	No	22.2	10.2	5.1	3.8	2.2

The Teacher-Student Identification Variables and Psychological Measures

We anticipated that the teacher- and student-identified group would be lowest on measures of psychological well-being, self-esteem and internal control, and that the student-identified only group would have the next lowest scores. The dependent variables are measures of the psychological state of the students, and we assumed that self-identification would be more strongly linked to psychological state than would teacher identification. We expected that these two sets of scores would be similar, since both sets of students identified themselves as handicapped.

The next group, considered by teachers to have some physical or emotional handicap that interfered with school work but who did not view themselves as handicapped/limited, we thought would have been reported only when the student was in a poor psychological state. The fourth group was comprised of the vast majority of students who neither saw themselves nor were seen by teachers to be handicapped. We expected these students to have the highest scores on these measures.

We carried out analyses of variance using the four groups just described as our independent variable (factor) and the locus of control, self-esteem and affect-balance scale scores as our criterion (dependent) variables. The analyses of variance (presented as multiple classification analysis tables) show the deviations of the mean of each subgroup from the grand mean.

When we look at table 4.4, we see that our hypothesized order was not correct. Although the teacher-and student-identified and nonhandicapped groups were as we had imagined, the two mixed groups were in reverse order of what we expected. The group of students identified by teachers as possibly having physical or emotional handicaps that interfered with their school work have lower self esteem, less sense of control of their fates, and lower affect-balance scores than did the students who were only self-defined as handicapped.

These differences are statistically significant and are interesting because they are all in the same pattern. If we control for the effects of the student's socioeconomic status, race, sex, any combinations or all of these, the self-esteem, affect-balance, and locus-of-control differences change very little, and the main effects remain significant.

We then combined student self-reports in 1980, student self-reports in 1982 and teacher's reports in 1980. The size of the sample in this analysis is 12,710, and we now have eight categories in the independent variable. The deviations of each of the group means from the grand mean of the psychological scales are presented in table 4.5.

In our analyses using the psychological scales, the locus-of-control scale has been the most sensitive to group differences. In table 4.5, the F value for that scale is 62 as compared to 17 and 18 for the other two scales.

Table 4.4. — Deviations from the mean on psychological scales, by teacher-student identifications of student as handicapped (unweighted sophomore data)

Is student handicapped?		Number of students	Self-esteem	Control of own fate	Well-being
Teacher	Student				
Yes	Yes	237	-.20	-.52	-1.55
Yes	No	462	-.16	-.26	-1.09
No	Yes	1,437	-.13	-.15	-0.59
No	No	10,134	+.03	+.04	+0.17
		F-statistic*	36.87	123.60	38.78
Degree of freedom (numerator)			3	3	3
Within-group standard deviation			.704	.623	4.06

*Statistical test of the hypothesis that group means are equal. This statistic is obtained by dividing the among-group mean square by the within-group mean square. The larger the F-statistics, the more heterogeneous the groups. The critical value of F with 3 and 22,000 degrees of freedom at the .01 probability level is 2.78.

Table 4.5 — Deviations from the mean scores on psychological scales, by combined teacher-student (1980 and 1982) identifications (unweighted sophomore data)

Is student handicapped?			Number of observations	Self-esteem	Locus-of-control	Affect-balance
Teacher	Student	Student				
1980	1980	1982		1980	1980	1980
Yes	Yes	Yes	120	-0.22	-0.47	-1.70
Yes	Yes	No	111	-.18	-.50	-1.38
Yes	No	Yes	86	-.35	-.44	-2.00
Yes	No	No	361	-.10	-.21	-.80
No	Yes	Yes	426	-.17	-.19	-1.07
No	Yes	No	998	-.12	-.13	-.41
No	No	Yes	1,287	+.01	-.09	+.01
No	No	No	8,782	+.03	+.06	+.19
			F-statistic*	17.3	62.1	18.3
Degree of freedom (numerator)				7	7	7
Within group standard deviation				.703	.625	4.05

*Statistical test of the hypothesis that group means are equal. This statistic is obtained by dividing the among-group mean square by the within-group mean square. The larger the F-statistics, the more heterogeneous the groups. The critical value of F with 3 and 22,000 degrees of freedom at the .01 probability level is 2.78.

There are three clusters of values for each of the scales in that table. The lowest cluster for all three scales is teacher identification with student identification in at least 1 year. The highest scores on all three scales are those of persons who are not identified as handicapped. Students who were self-identified as handicapped in 1982 only are also high; for both self-esteem and locus-of-control, that group mean is very close to that of the nonhandicapped.

Summary and Conclusions

The analyses demonstrate that being identified as handicapped by teachers is a strong variable. We had hypothesized that the teacher- and student-identified would be the group with the lowest grades and test scores and the highest dropout rate. In fact, the group identified by teachers only (and not themselves) had the lowest grades and, not surprisingly, given those grades, the highest dropout rate. However, the students with the lowest test scores were those who concurred with teachers in being identified as handicapped. These students correctly recognized that they were in a weak position from which to perform well in high school.

The teachers in the HS&B samples were astute observers. They were able to identify students who did not themselves recognize that they were handicapped but who were likely to drop out in spite of having had somewhat higher test scores than students who concurred with teacher identification. The teachers could tell which students in the 10th grade were on a trajectory toward dropping out.

When we looked at the psychological variables, we again saw the strength of teacher identifications. Those students identified by teachers as being handicapped had lower scores on those scales than did students who were self-identified only.

Clearly, students whom teachers identify as having handicaps that interfered with school work were indeed in some difficulty. They could well have used some aggressive assistance with their education which might have been beyond the scope of regular classroom teaching. The fact that students did not recognize their hand-

icaps does not mean that the teachers were incorrect. Evidence from grades, tests, dropout rates and psychological scales shows that the teachers identified a distinct subgroup of students. That some students identified themselves as handicapped without teacher confirmation is not surprising, since their difficulties may not have affected their school work, or may have interferred marginally, so that their difficulties were not visible to teachers.

Teacher ratings are an important source of information about student handicaps, but a source focused on school performance. Not working up to potential might not be seen as a handicap if the students were getting by in school. And student ratings are important too. Many students who describe themselves as handicapped needed assistance if they were to complete high school successfully.

Chapter 5

The HS&B Data Set and Future Research

An underlying assumption of recent policy directives for the education of handicapped students is that their school experiences have been of lower quality than those of nonhandicapped students. The concept of "school experience" includes a very broad range of phenomena, and seeking to compare the experiences of different groups requires limiting that range quite severely. We suggest below ways in which the HS&B data set may be used to study aspects of the high school experiences of handicapped students.

Public Law 94-142 set guidelines prescribing the experiences handicapped students are entitled to within schools. The most important of these guidelines are that all handicapped students are to receive (1) individualized educational programs (IEP's) and (2) placement within the least restrictive educational environment possible (or "mainstreamed"). The latter provision departed from the theory and practice of special education developed in the 1950's and 1960's, which involved placing handicapped students in special and typically isolated programs. The basic criticism of this approach was that it tended to deprive handicapped young people of the opportunity to establish relationships with nonhandicapped youth and initiated a process that compounded the problems that the handicapped face. Counter-arguments are that handicapped students are typically unable to keep up with the pace of instruction in the regular curriculum programs. They then become discouraged and either withdraw or create disciplinary problems. We don't know how many of the handicapped students identified in HS&B have been mainstreamed in response to the tenets of the law. We do know that some of them have been socially defined as handicapped (since they have been in special programs for the handicapped).

While a considerable body of research has developed around some aspects of the effects of mainstreaming, a number of important questions remain unaddressed. Outside of this report, little information exists about the curriculum placement of handicapped students. Since the Coleman et al. (1966) study found little variation in academic outcomes among high schools, research on effects of schooling has increasingly turned to describing and analyzing how student experiences are differentiated by the internal structure of schools. Any effort to address the effects of mainstreaming at the high school level must take account of the program in which the handicapped student is placed and the coursework taken by the student within that program.

A second aspect involved in the effort to assess the effects of mainstreaming concerns the extent to which handicapped students participate in the extracurricular programs that schools offer. While there is some evidence that participation in these activities affects student academic outcomes (Otto, 1975), it is likely that these activities mainly provide an important means of maintaining student morale and of developing friendships (Waller 1938, Spady 1970). The HS&B data set would allow examination of curricular program placement, coursework patterns, and the extracurricular activities of handicapped students.

The HS&B sample provides a set of students who felt handicapped, many of whom had some trouble with their school work, and many of whom were vaguely unhappy about school. Some of these students had been in special programs for the physically or educationally handicapped; many others had been in remedial programs; and some had been in advanced or accelerated programs. So a portion of them had received some of the special services that schools offer. But they are mainly not getting the extremely active interventions prescribed by Public Law 94-142.

We hope that we have presented enough evidence to convince even conservative researchers, in their exploration of this data, to study even those students who report being handicapped at only one point in time. If not, the teacher identifications would be valuable for certain kinds of studies. But we must be aware that teachers would identify only those students who perform very poorly in classes or who are disciplinary problems. A quiet student in need of help might not be noticed by the teacher. Or the researcher could elect to use only those students who identified themselves as handicapped both years, for the most conservative approach. (And one that in our view would omit an important segment of the slightly handicapped student population.) We recommend that all researchers studying handicapped students focus on (or at least include) the sophomore cohort, since a higher proporton of the students of interest

would have been eligible to be drawn into that cohort's sample.

The HS&B data set is extremely rich, and this report has not begun to explore the information about handicapped students (by any of these definitions) that the data contain. We have mentioned three areas that seem to us to be major candidates for additional research using only the data already available for public use. As the education and career patterns of these students unfold, the longitudinal data about them will be unparalleled. Rosenbert studied the occupational and financial status of a group of highly motivated and well-educated, mildly orthopedically handicapped adults. The data indicate that those with the best chance for full economic functioning were those with vocational or college training leading to positions in the occupation structure where equality of opportunity is protected by law.

Appendix A

Tabular Profiles of Handicapped Students

As a convenience for other researchers who may wish to use the HS&B data for analyzing handicapped students or students with particular handicaps, we have prepared a small set of tabular profiles of the sophomore cohort students who identified themselves as handicapped.

Table A.1 shows the 1980 data for the sophomore cohort; the 1982 data and the combined handicapped variable used in this report are presented in table A.2. The percentages in these two tables are weighted, but we also show the unweighted number of students who provided the data.

If we review these tables, we see that in 1980, the students who reported having specific learning disabilities, being hard of hearing or deaf, or having speech disabilities followed a pattern. They tended to be male and minority group members. They generally registered in the lowest quartiles of SES, test scores and grades. They were also likely to have repeated grades before high school and to have high dropout rates. Students who reported other health impairments had a similar profile, except that they are nearly evenly male and female.

Visual handicaps were also reported more equally by males and females, and non-Hispanic whites are not underrepresented in this category.

Students with orthopedic handicaps present quite a different picture. Except for a slight overrepresentation of males (56 percent), these handicaps seem not to be related to the profile variables.

If we compare the 1982 self-identification with those of 1980 (using the same profile variables), we see that students who reported these handicaps were still preponderantly male. But more of them were non-Hispanic whites (68.5 percent as compared to 62 percent), and fewer of them were from the lowest SES and test score quartiles.

The students who reported that they were limited in 1980 were also predominantly male, minority group members and from the lowest test score and SES quartiles. About a fifth of them had repeated a grade before entering high school. The students who said they were limited in 1982 were similar, except that a higher proportion of them were white (67 percent as compared to 60 percent) and fewer of them had been in the lowest test quartile in 1980 (34 percent as compared to 42 percent).

Students who had been in special programs for the physically or educationally handicapped in 1980 were quite similar on these variables to both the handicapped and limited groups, except that the proportions of males and females were more nearly equal.

The last four lines in table A.2 show the students who reported they were handicapped in both years, in one year or in neither year (using the combined definitions for 1980 and 1982). The variable "special program for the educationally handicapped" was not included in the combined definition. Although we made that decision because it seemed insufficient to include that as the only indicator or educational handicap, we would not exclude those students again. (Some of them were in the definition for other reasons; for example, 36 percent were also in programs for the physically handicapped.) It is also important to remember that some respondents reported more than one condition, and that students who said they were handicapped in 1980 and in 1982 may have reported very different conditions in the 2 years. Consistent responses in this variable merely indicate that their responses were somewhere within our combined definition both years. (The number of students who reported exactly the same condition both years is presented as the last column in table A.2.)

Table A.1. — Profile of handicapped students, 1980, using various definitions (weighted sophomore cohort data)

Item	Number of observations (unweighted)	Percent male	Percent non-Hispanic white	Percent in lowest SES quartile (1980)	Percent in lowest test quartile (1980)	Percent in general program (1982)	Percent with C's & D's (1980)	Percent dropouts	Number who had repeated a grade
A. Specific learning disability	716	61.6	52.4	43.0	66.4	42.7	42.5	21.8	32.8
B. Visual handicap	389	52.5	75.4	26.1	17.4	33.2	20.3	17.7	16.1
C. Hard of hearing	520	60.3	66.3	33.0	41.9	43.4	30.8	23.5	17.9
D. Deafness	123	64.3	53.1	38.0	62.0	39.2	43.0	29.9	25.1
E. Speech disability	454	66.4	47.5	44.4	59.4	37.7	32.1	18.5	25.0
F. Orthopedic handicap	354	55.8	74.8	17.8	18.5	28.7	18.2	12.4	10.3
G. Other health impairment	511	51.0	62.6	37.8	38.2	37.9	30.3	23.5	21.4
H. Handicapped - one or more, A-G	2,690	57.8	62.1	34.5	42.4	38.2	30.3	19.7	21.4
I. Physical condition that limits	2,069	56.2	60.1	34.0	41.9	39.6	29.7	20.0	20.0
J. Program for educationally handicapped*	898	54.5	61.7	31.1	42.7	37.0	30.2	21.7	23.1
K. Program for physically handicapped	840	53.3	60.5	27.0	38.9	36.7	28.4	18.1	20.7
L. Handicapped - combined definition	4,192	56.3	61.3	32.4	41.2	38.3	29.2	18.6	20.2
Percent in population		49.9	72.6	24.7	24.2	35.2	20.8	13.7	13.5

*Not included in combined definition.

Table A.2. — Profile of handicapped students, 1982, using various definitions (weighted sophomore cohort data)

Item	Number of observations (unweighted)	Percent male	Percent non-Hispanic white	Percent in lowest SES quartile (1980)	Percent in lowest test quartile (1980)	Percent in general program (1982)	Percent with C's & D's (1980)	Percent dropouts	Percent who had repeated a grade	Number who reported this condition both years
A. Specific learning disability	483	66.1	63.8	27.9	63.2	43.2	37.7	26.5	39.6	126
B. Visual handicap (not corrected by glasses)	418	56.4	67.1	30.3	31.3	39.3	28.2	25.8	22.5	33
C. Hard of hearing	460	59.8	71.3	30.7	33.6	35.5	32.4	22.0	25.6	164
D. Deafness	123	67.3	41.7	39.8	60.8	33.6	29.1	16.5	32.8	20
E. Speech disability	310	68.4	55.1	40.0	57.4	43.5	30.3	21.9	26.9	80
F. Orthopedic handicap	228	57.7	72.2	25.7	25.2	35.4	21.2	22.8	17.5	55
G. Other physical disability or handicap	651	55.1	75.1	24.3	23.3	38.5	25.6	21.9	17.7	70
Total handicapped—one or more, A-G	2,211	59.4	68.5	29.5	37.1	38.6	30.2	22.2	22.8	788
Physical condition that limits	2,156	55.7	67.1	29.6	33.6	39.5	25.6	16.3	18.3	348
Program for educationally handicapped*	550	48.2	69.4	25.0	35.4	37.9	24.5	(—)	17.7	89
Program for physically handicapped	513	48.0	67.8	26.0	32.8	35.9	23.4	(—)	16.6	83
Div. Voc. Rehab. Ed. benefits	474	62.6	44.2	35.4	55.6	37.9	33.9	(—)	23.4	(—)
Handicapped—combined definition	4,762	55.3	68.7	28.3	33.8	38.1	26.8	15.3	19.0	(—)
Handicapped both years	1,396	59.6	62.3	34.1	45.4	38.4	31.2	19.1	25.7	(—)
Handicapped 1980 only	2,729	54.4	60.8	31.2	38.9	38.0	27.9	18.3	16.9	(—)
Handicapped 1982 only	3,357	53.2	72.0	25.4	27.9	38.0	24.8	13.2	16.0	(—)
Not handicapped	21,877	48.0	75.2	22.9	19.9	34.1	18.4	12.6	11.7	(—)
Percent in population		49.9	72.6	24.7	24.2	35.2	20.8	13.7	13.5	(—)

*Not included in combined definition.
—Not applicable

Appendix B

Definitions of Constructed Variables

1. Handicapped status—

Students who answered yes to one of the following were included in our definition of handicapped/limited:

A. Do you have any of the following conditions? (MARK ALL THAT APPLY)

1980	1982
Specific learning disability	Same
	Visual handicap (not corrected by glasses)
Hard of hearing	Same
Deafness	Same
Speech disability	Same
Orthopedic handicap	Same
	Other physical disability or handicap

B. Do you feel that you have a physical condition that limits the kind or amount of work you can do on a job, or affects your chances for more education?

C. Have you ever been in any of the following kinds of courses or programs in high school?

... Special program for the physically handicapped

(In 1982 for the sophomore cohort)—In your junior or senior year have you been in any of the following kinds of courses or programs in high school?

... Special program for the physically handicapped

D. (In 1980 for the senior cohort and in 1982 for the sophomore cohort)—Do you plan to use funds available from any of the following programs for further study beyond high school?

... Division of Vocational Rehabilitation Educational Benefits

Using this definition, each student was categorized (self-identified) as handicapped or not in 1980 and again in 1982. These two classifications were combined giving a four-category variable: handicapped in 1980 and 1982, handicapped in 1980 only, in 1982 only, or not handicapped.

2. Teacher identification—

Teachers were asked to indicate—for students they had in class during the school year and "knew"- whether the student had or may have had a physical or emotional handicap that was affecting his or her school work. In some places in the text of the report, we refer to "any teacher's identification as handicapped." That means that one or more teachers identified the student as handicapped. For the main analysis using teacher data, we used the following decision rule: no student was classified as teacher-identified unless two or more teachers (or a majority if more than two reported) agreed that he or she was handicapped.

3. High school program—

Student responses to the question, "Which of the following best describes your present high school program?" were grouped as follows:

ORIGINAL CATEGORIES	RECODES
Academic or college preparatory	Academic
General	General
Agricultural occupations, business or office occupations, distributive education, health occupations, home economics occupations, technical occupations, trade or industrial occupations.	Vocational

4. Grades so far in high school—

Student responses to the question, "Which of the following best describes your grades so far in high school?" were grouped as follows:

ORIGINAL CATEGORIES	RECODES
Mostly A (a numerical average of 90-100) About half A and half B (85-89)	A and B+
Mostly B (80-84) About half B and half C (75-79)	B and C+
Mostly C (70-74) About half C and half D (65-69) Mostly D (60-64) Mostly below D (below 60)	C and below

5. Educational aspirations/expectations—

Student responses to the question, "As things stand now, how far in school do you think you will get?" were grouped as follows:

ORIGINAL CATEGORIES	RECODES
Less than high school graduation	High school graduation or less
High school graduation only	
Vocational, trade or business school after Less than 2 years 2 years or more	Postsecondary vocational high school
Less than 2 years of college 2 or more years of college (including 2-year degree) Finish college (4 or 5 year degree) Ph.D., M.D. or other	College

6. Student plans for how they will spend most of their time the year after high school—

Student responses to the question, "What is the one thing that most likely will take the largest share of your time in the year after you leave high school?" were grouped as follows:

ORIGINAL CATEGORIES	RECODES
Taking academic courses at a junior or community college, full- or part-time Attending a 4-year college or university full or part-time	College or university
Entering an apprenticeship or on-the-job training program Taking vocational or technical subjects at a junior or community college full-time or part-time Taking vocational or technical courses at a trade or business school full-time or part-time	Vocational
Working full-time Going into regular military service (or service academy) Working part-time but not attending school or college	Work including military
Being a full-time homemaker Other (travel, take a break, no plans)	Other

7. Psychological scales—

a. Self-esteem

I take a positive attitude toward myself.
I feel I am a person of worth; on an equal plane with others.
I am able to do things as well as most other people.
On the whole, I am satisfied with myself.

b. Locus-of-control

Good luck is more important than hard work for success. Every time I try to get ahead, something or somebody stops me.
Plans hardly ever work out.
People who accept their condition in life are happier than those who try to change things.

Responses to these items were coded as follows:

agree strongly 1
agree 2
disagree 3
disagree strongly 4

Student responses to each component were standardized separately and the non-missing components were averaged.

c. Bradburn's affect-balance scale

During the past few weeks, did you ever feel . . .

1. Particularly excited or interested in something?
2. So restless that you couldn't sit long in a chair?
3. Proud because someone complimented you on something you had done?
4. Very lonely or remote from other people?
5. Pleased about having accomplished something?

6. Bored?
7. On top of the world?
8. Depressed or very unhappy?
9. That things were going your way?
10. Upset because someone criticized you?

Responses were:

Never 1
Once 3
Several times 3
A lot 4

Responses to items (1), (3), (5), (7), and (9) were summed to form the positive affect scale. Those of items (2), (4), (6), (8), and (10) were summed to form the negative affect scale. The negative scores were then subtracted from the positive score for the affect-balance score. (A constant of 15 is added to avoid negative scores.)

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