

# National Education Longitudinal Study of 1988 (NELS:88)

Website: <http://nces.ed.gov/surveys/nels88/>

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## 1. OVERVIEW

The National Education Longitudinal Study of 1988 (NELS:88) was the third major secondary education longitudinal survey sponsored by NCES. The first two surveys—the National Longitudinal Study of the High School Class of 1972 (NLS:72) and the High School and Beyond (HS&B) Longitudinal Study—examined the educational, vocational, and personal development of young people, beginning in high school. (See chapters on NLS and HS&B for descriptions of these studies.) The fourth high school longitudinal study, the Education Longitudinal Study of 2002 (ELS:2002), was designed to provide trend data about critical transitions experienced by students as they proceed through high school and into postsecondary education or their careers. (See NELS chapter for a description of this study.) NELS:88 provides new data about critical transitions experienced by students as they proceed from 8th grade through high school and into postsecondary education or the workforce. It expands the knowledge base of the two previous studies by surveying adolescents at an earlier age and following them into the 21st century.

The NELS:88 base-year survey included a national probability sample of 1,052 public and private 8th-grade schools, with almost 25,000 participating students across the United States. Three follow-up surveys were conducted at 2-year intervals from 1990 to 1994. In 1994 (the third follow-up), most sample members were 2 years out of high school. A fourth follow-up was conducted in 2000. In addition to surveying and testing students, NELS:88 gathered information from the parents of students, teachers, and school administrators. Furthermore, two rounds of transcript data were collected on the 8th-grade cohort. High school transcripts were collected for all participants in the school-age sample, including dropouts and early graduates. Postsecondary transcripts were collected for students who reported attending a school beyond high school.

### Purpose

To provide trend data about critical transitions experienced by young people as they leave elementary school and progress through high school into postsecondary institutions or the workforce, and provide data for trend comparisons with results from NLS:72 and HS&B as well as later longitudinal studies, such as ELS: 2002.

### Components

NELS:88 collected survey data from students, dropouts, parents, teachers, and school administrators. Supplementary information was gathered from high school transcripts and course offering data provided by the schools, a Base-Year Ineligible (BYI) Study, a Followback Study of Excluded Students (FSES), a High School Effectiveness Study (HSES), and a Postsecondary Education Transcript Study. The various components are described below.

**Base-Year Survey.** The base-year survey was conducted during the spring school term in 1988 and included the following:

*Student Questionnaire (8<sup>th</sup>-Grade Questionnaire).* Students were asked to fill out a questionnaire that included items on their home background, language use, family, opinions about themselves, plans for the future, job and chores,

### LONGITUDINAL SAMPLE SURVEY OF THE 8<sup>TH</sup>-GRADE CLASS OF 1988; BASE-YEAR SURVEY AND FOUR FOLLOW-UPS THROUGH 2000

NELS:88 collected data from:

- Students and dropouts
- School administrators
- Teachers
- Parents/guardians
- High school transcripts
- High school course offerings
- High School Effectiveness Study
- Postsecondary education transcripts

school life, schoolwork, and activities. Students also completed a series of curriculum-based cognitive tests in four achievement areas—reading, mathematics, science, and social studies (history/government).

*Parent Questionnaire.* One parent of each student completed a questionnaire requesting information about both parents' background and socioeconomic characteristics, aspirations for their children, family willingness to commit resources to their children's education, the home educational support system, and other family characteristics relevant to achievement.

*Teacher Questionnaire.* A Teacher Questionnaire was administered to selected 8<sup>th</sup>-grade teachers responsible for instructing sampled students in two of the four test subjects—mathematics, science, English, and social studies. The questionnaire collected information in three areas: teachers' perceptions of the sampled students' classroom performances and personal characteristics; curriculum content of the areas taught; and teachers' background and activities. Two teachers were asked to respond for each student.

*School Administrator Questionnaire.* Completed by an official in the participating school, this questionnaire collected information about school, student, and teacher characteristics; school policies and practices; the school's grading and testing structure; school programs and facilities; parent involvement in the school; and school climate.

*First Follow-up Survey.* The first follow-up survey was conducted in spring 1990. It collected information from students, teachers, and school administrators, but not parents. The student sample was freshened to be nationally representative of students enrolled in the 10<sup>th</sup> grade in spring 1990. In addition, three new components were initiated: the Dropout Questionnaire, the Base-Year Ineligible (BYI) Study, and the High School Effectiveness Study (HSES).

Students were again requested to complete a questionnaire and take cognitive tests. The Student Questionnaire collected background information and asked students about such topics as their school and home environments, participation in classes and extracurricular activities, current jobs, goals and aspirations, and opinions about themselves. Dropouts were asked similar questions in a separate *Not Currently in School Questionnaire* (or *Dropout Questionnaire*), which also requested specific information about reason(s) for leaving school and experiences in and out of school. Dropouts were also given cognitive tests when feasible.

School administrators provided information about their high schools in the School Administrator Questionnaire, and two teachers for each student completed the Teacher Questionnaire. There were different Teacher Questionnaires for English, mathematics, science, and history. The School Administrator and Teacher Questionnaires provided information about school administration, school programs and services, curriculum and instruction, and teachers' perceptions about their students' learning.

*Second Follow-up Survey.* The second follow-up survey, conducted in 1992, repeated all the components of the first follow-up survey and included the Parent Questionnaire. The student sample was again freshened to be nationally representative of students enrolled in the 12<sup>th</sup> grade in spring 1992. A new High School Transcript Study provided archival data on the academic experience of high school students. Students in high schools designated in the first follow-up for HSES were surveyed and tested again in both the main second follow-up survey and a separate HSES.

As in the previous waves, students were asked to complete a questionnaire and cognitive tests. The cognitive tests were designed to measure 12<sup>th</sup>-grade achievement and cognitive growth between 1988 and 1992 in mathematics, science, reading, and social studies (history/citizenship/geography). The questionnaire asked students about such topics as academic achievement; perceptions about their curricula and schools; family structures and environments; social relations; and aspirations, attitudes, and values relating to high school, occupations, and postsecondary education. The Student Questionnaire also contained an *Early Graduate Supplement*, which asked early graduates to document the reasons for and circumstances of their early graduation. Students who were first-time participants in NELS:88 completed a *New Student Supplement*, containing basic demographic items requested in the base year but not repeated in the second follow-up. First follow-up dropouts were resurveyed and retested. School administrators completed the School Administrator Questionnaire, and one mathematics or science teacher for each student completed the Teacher Questionnaire.

*Third Follow-up Survey.* The third follow-up survey, conducted in 1994, contained only the Student Questionnaire, which collected information mainly on issues related to employment and postsecondary education. Specific content areas included academic achievement; perceptions and feelings about school and/or job; work experience and work-related training;

application and enrollment in postsecondary education institutions; sexual behavior, marriage, and family; and values, leisure-time activities, volunteer activities, and voting behavior.

**Fourth Follow-up Survey.** The fourth follow-up survey, conducted in 2000, contained only the Student Questionnaire, which collected information mainly on issues of employment and postsecondary education. Specific content areas included academic achievement; perceptions and feelings about school and/or job; work experience and work-related training; application and enrollment in postsecondary education institutions; sexual behavior, marriage, and family; and values, leisure-time activities, volunteer activities, and voting behavior.

**Supplemental Studies.** The following supplemental studies were conducted during the course of the NELS:88 project:

**Base-Year Ineligible (BYI) Study.** The BYI Study was added to the first follow-up survey to ascertain the status of students who were excluded from the base-year survey due to a language barrier or physical or mental disability that precluded them from completing a questionnaire and cognitive tests. Any students found to be eligible at this time were included in the follow-up surveys.

**Followback Study of Excluded Students (FSES).** This study—a part of the second follow-up survey—was a continuation of the first follow-up BYI Study.

**High School Transcript Study.** This study collected high school transcripts during the second follow-up survey. Complete transcript records were collected for (1) students attending sampled schools in spring 1992; (2) dropouts (including those in alternative programs) and early graduates; and (3) sample members who were ineligible for any wave of the survey due to mental or physical disability or language barriers. The transcript data collected from schools included student-level data (e.g., number of days absent per school year, standardized test scores) and complete course-taking histories (e.g., information on credits earned; year and term a specific course was taken; and final grades). (For more information, see chapter on HST studies.)

**High School Effectiveness Study (HSES).** To facilitate longitudinal analysis at the school level, a School Effects Augmentation was implemented in the first follow-up survey to provide a valid probability sample of 10<sup>th</sup>-grade schools. From the pool of NELS:88 first follow-up schools, a probability subsample of 251 urban and suburban schools in the 30 largest

Metropolitan Statistical Areas was selected for the HSES; 248 of these schools were HSES participants in the first follow-up. The NELS:88 national or “core” student sample in these schools was augmented to obtain a within-school representative student sample large enough to support school effects research (i.e., the effects of school policies and practices on students). These schools and students were followed up in 1992—when the majority of the students were in 12<sup>th</sup> grade—as part of both the main NELS:88 second follow-up survey and the HSES. The HSES also provided a convenient framework for a constructed-response testing experiment in 1992. The test contained four questions that required students to derive answers from their own knowledge and experience (e.g., write an explanation, draw a diagram, solve a problem). Mathematics tests were assigned to half of the schools that were willing to commit the extra time required for such testing; the other half were assigned science tests. The second follow-up HSES was also enhanced by the collection of curriculum offerings in the Course Offerings Component. (See below.)

**Course Offerings Component.** This component was added to the second follow-up to provide curriculum data that can serve as a baseline for studying student outcomes. The course offerings data for this component were collected from the HSES schools. These data illuminate trends when examined in conjunction with data from the transcript studies conducted as part of the 1982 HS&B and the 1987, 1990, 1994, and 1998 National Assessment of Educational Progress (NAEP).

**Postsecondary Education Transcript Study.** The Postsecondary Education Transcript Study was conducted as part of the fourth follow-up survey in 2000. It targeted transcripts from all U.S. postsecondary institutions attended by NELS sample members in the fourth follow-up, excluding postsecondary information collected from foreign institutions, non-degree-granting programs, and non-credit-granting institutions. The Postsecondary Education Transcript Study supplements the postsecondary education information collected in the 1994 and 2000 follow-ups by including detailed information on types of degree programs, periods of enrollment, majors or fields of study for instructional programs, specific courses taken, grades and credits attained, and credentials earned.

#### **Periodicity**

Biennial from 1988 to 1994, a fourth follow-up was conducted in 2000. The Base-Year Ineligible Study was conducted in 1990 as part of the first follow-up; a

continuation study, the Followback Study of Excluded Students, was conducted in 1992 as part of the second follow-up. The High School Effectiveness Study was conducted in the first and second follow-ups. The High School Transcript Study was implemented in the second follow-up in 1992. The Postsecondary Education Transcript Study was conducted as part of the fourth follow-up in 2000.

### Data Availability

Restricted-use data are available for NELS:88 through the fourth wave and postsecondary education transcript study at <https://nces.ed.gov/pubsearch/licenses.asp>.

## 2. USES OF DATA

The NELS:88 project was designed to provide trend data about critical transitions experienced by students as they leave elementary school and progress through high school and into postsecondary education or the workforce. Its longitudinal design permits the examination of changes in young people's lives and the role of school in promoting growth and positive life outcomes. The project collects policy-relevant data about educational processes and outcomes, early and late predictors of dropping out, and school effects on students' access to programs and equal opportunity to learn. These data complement and strengthen state and local efforts by furnishing new information on how school policies, teacher practices, and family involvement affect student educational outcomes (e.g., academic achievement, persistence in school, and participation in postsecondary education).

NELS:88 data can be used in three ways: in cross-sectional, longitudinal, and cross-cohort analyses (by comparing NELS:88 findings with those of NLS:72, HS&B, and ELS:2002). By following young adolescents at an earlier age (beginning in 8<sup>th</sup> grade) and into the 21st century, NELS:88 expands the base of knowledge established in the NLS:72 and HS&B studies. NELS:88 first follow-up data provide a comparison point to high school sophomores 10 years earlier, as studied in HS&B. NELS:88 second follow-up data allow trend comparisons of the high school class of 1992 with the 1972 and 1980 seniors studied in NLS:72 and HS&B, respectively. The NELS:88 third follow-up allows comparisons with NLS:72 and HS&B related to postsecondary outcomes. ELS:2002 is different from NELS:88 in that the base-year sample students are 10th-graders rather than 8<sup>th</sup>-graders. With a freshened senior sample, the ELS:2002 first follow-up supports comparisons with the NELS:88 second follow-up. The ELS:2002 first follow-up academic transcript component also offers a further opportunity for a cross-cohort comparison with the high school

transcript studies of NELS:88. Together, the four studies provide measures of educational attainment in the United States and rich resources for studying the reasons for and consequences of academic success and failure.

More specifically, NELS:88 data can be used to investigate

- *transitions from elementary to secondary school*: how students are assigned to curricular programs and courses; how such assignments affect their academic performance as well as future career and postsecondary education choices;
- *academic growth over time*: family, community, school, and classroom factors that promote growth; school classroom characteristics and practices that promote learning; effects of changing family composition on academic growth;
- *features of effective schools*: school attributes associated with student academic achievement; school effects analyses;
- *the dropout process*: contextual factors associated with dropping out; movement in and out of school, including alternative high school programs;
- *the role of the school in helping the disadvantaged*: school experiences of the disadvantaged; approaches that hold the greatest potential for helping them;
- *school experiences and academic performance of language-minority students*: variation in achievement levels; bilingual education needs and experiences;
- *students' mathematics and science learning* : math and science preparation received by students; student interest in these subjects; encouragement by teachers and school to study advanced mathematics and science; and
- *transitions from high school to college and postsecondary access/choice*: planning and application behaviors of the high school class of 1992; subsequent enrollment in postsecondary institutions.

## 3. KEY CONCEPTS

Some of the key terms related to NELS:88 are defined below.

**Cognitive Test Battery.** Cognitive tests measuring student achievement in mathematics, reading, science, and social studies (history/citizenship/geography) were administered in the base year, first follow-up, and second follow-up. The contents was as follows: (1) reading (21 items, 21 minutes); (2) mathematics (40 items, 30 minutes); (3) science (25 items, 20 minutes);

and (4) social studies (30 items, 14 minutes—the base-year test included history and government items; the first and second follow-up tests included history, citizenship, and geography items).

**Socioeconomic Status (SES).** A composite variable constructed from five questions in the Parent Questionnaire: father's education level, mother's education level, father's occupation, mother's occupation, and family income. When all parent variables were missing, student data were used to compute the SES, substituting household items (e.g., dictionary, computer, more than 50 books, washing machine, calculator) for the family income variable. There are separate SES variables derived from parent data in the base year and the second follow-up. The database also included variables for SES quartiles.

**Dropout.** Used both to describe an event (leaving school before graduating) and a status (an individual who was not in school and not a graduate at a defined point in time). The NELS:88 “cohort dropout rate” is based on a measurement of the enrollment status of 1988 8<sup>th</sup>-graders 2 and 4 years later (in spring 1990 and spring 1992) and of 1990 sophomores 2 years later (in spring 1992). For a given point in time, a respondent is considered to be a dropout if he or she had not graduated from high school or attained an equivalency certificate and had not attended high school for 20 consecutive days (not counting excused absences). Transferring to another school is not regarded as a dropout event, nor is delayed graduation if a student was continuously enrolled but took an additional year to complete high school. A person who dropped out of school may have returned later and graduated. This person would be considered a “dropout” at the time he or she initially left school and a “stopout” at the time he or she returned to school.

## 4. SURVEY DESIGN

### Target Population

Students enrolled in the 8<sup>th</sup> grade in “regular” public and private schools located in the 50 states and the District of Columbia in the spring 1988 school term. The sample was freshened in both the first and second follow-ups to provide valid probability samples that would be nationally representative of 10<sup>th</sup>-graders in spring 1990 and 12<sup>th</sup>-graders in spring 1992. The NELS:88 project excludes the following types of schools: Bureau of Indian Education (BIE)<sup>1</sup> schools, special education schools for the handicapped, area

vocational schools that do not enroll students directly, and schools for dependents of U.S. personnel overseas. The following students are also excluded: mentally handicapped students and students not proficient in English, for whom the NELS:88 tests would be unsuitable; and students having physical or emotional problems that would make participation in the survey unwise or unduly difficult. However, the Base-Year Ineligible Study (in the first follow-up) and the Followback Study of Excluded Students (in the second follow-up) sampled excluded students and added those no longer considered ineligible to the freshened sample of the first and second follow-ups, respectively.

### Sample Design

NELS:88 was designed to follow a nationally representative longitudinal component of students who were in the 8<sup>th</sup> grade in spring 1988. It also provides a nationally representative sample of schools offering 8<sup>th</sup> grade in 1988. In addition, by freshening the student sample in the first and second follow-ups, NELS:88 provides nationally representative populations of 10<sup>th</sup>-graders in 1990 and 12<sup>th</sup>-graders in 1992. To meet the needs for cross-sectional, longitudinal, and cross-cohort analyses, NELS:88 involved complex research designs, including both longitudinal and cross-sectional sample designs.

**Base-Year Survey.** In the base year, students were selected using a two-stage stratified probability design, with schools as the first-stage units and students within schools as the second-stage units. From a national frame of about 39,000 schools with 8<sup>th</sup> grades, a pool of 1,030 schools was selected through stratified sampling with probability of selection proportional to their estimated 8<sup>th</sup>-grade enrollment; private schools were oversampled to ensure adequate representation. A pool of 1,030 replacement schools was selected by the same method to be used as substitutions for ineligible or refusal schools in the initial pool. A total of 1,060 schools cooperated in the base year; of these, 1,060 schools (815 public and 237 private) contributed usable student data. The sampling frame for NELS:88 was the school database compiled by Quality Education Data, Inc., of Denver, Colorado, supplemented by racial/ethnic data obtained from the U.S. Office for Civil Rights and school district personnel.

Student sampling produced a random selection of 26,440 8<sup>th</sup>-graders in 1988; 24,600 participated in the base-year survey. Hispanic and Asian/Pacific Islander

<sup>1</sup> These were referred to as Bureau of Indian Affairs (BIA) funded schools.

students were oversampled. Within each school, approximately 26 students were randomly selected (typically, 24 regularly sampled students and 2 oversampled Hispanic or Asian/Pacific Islander students). In schools with fewer than 24 8<sup>th</sup>-graders, all eligible students were selected. Potential sample members were considered ineligible and excluded from the survey if disabilities or language barriers were seen as obstacles to successful completion of the survey. The eligibility status of excluded members was reassessed in the first and second follow-ups. (See below.)

**First Follow-up Survey.** There were three basic objectives for the first follow-up sample design. First, the sample was to include approximately 21,500 students who were in the 8<sup>th</sup>-grade sample in 1988 (including base-year nonrespondents), distributed across 1,500 schools. Second, the sample was to constitute a valid probability sample of all students enrolled in the 10<sup>th</sup> grade in spring 1990. This entailed “freshening” the sample with students who were 10<sup>th</sup>-graders in 1990 but who were not in the 8<sup>th</sup> grade in spring 1988 or who were out of the country at the time of base-year sampling. The freshening procedure added 1,230 10<sup>th</sup>-graders; 1,040 of the students in this new group were found to be eligible and were retained after final subsampling for the first follow-up survey. Third, the first follow-up was to include a sample of students who had been deemed ineligible for base-year data collection due to physical, mental, or linguistic barriers to participation. The Base-Year Ineligible Study reassessed the eligibility of these students so that those able to take part in the survey could be added to the first follow-up student sample. Demographic and school enrollment information was also collected for all students excluded in the base year, regardless of their eligibility status for the first follow-up.

While schools covered in the NELS:88 base-year survey were representative of the national population of schools offering the 8<sup>th</sup> grade, the schools in the first follow-up were not representative of the national population of high schools offering the 10<sup>th</sup> grade. By 1990, the 1988 8<sup>th</sup>-graders had dispersed to many high schools, which did not constitute a national probability sample of high schools. To compensate for this limitation, the High School Effectiveness Study (HSES), which was designed to sustain analyses of school effectiveness issues, was conducted in conjunction with the first follow-up. From the pool of participating first follow-up schools, a probability subsample of 251 urban and suburban schools in the 30 largest Metropolitan Statistical Areas were designated as HSES schools. The NELS:88 core student sample was augmented to obtain a within-school

representative student sample large enough to support school effects research. The student sample was increased in HSES schools by an average of 15 students to obtain within-school student cluster sizes of approximately 30 students.

**Second Follow-up Survey.** The second follow-up sample included all students and dropouts selected in the first follow-up. From within the schools attended by the sample members, 1,500 12<sup>th</sup>-grade schools were selected as sampled schools. Of these, the full complement of component activities occurred in 1,370 schools. For students attending schools other than these 1,370 schools, only the Student and Parent Questionnaires were administered. As in the first follow-up, the student sample was augmented through freshening to provide a representative sample of students enrolled in the 12<sup>th</sup> grade in spring 1992. Freshening added into the sample 243 eligible 12<sup>th</sup>-graders who were not in either the base-year or first follow-up sampling frames. Schools and students designated for the HSES in the first follow-up were followed up again—as part of both the main second follow-up survey and a separate HSES. The Followback Study of Excluded Students was a continuation of the first follow-up Base-Year Ineligible Study. In addition, two new components—the High School Transcript Study and the Course Offerings Component—were added to the second follow-up.

**Third Follow-up Survey.** The third follow-up student sample was created by dividing the second follow-up sample into 18 groups based on students’ response history, dropout status, eligibility status, school sector type, race, test scores, SES, and freshened status. Each sampling group was assigned an overall selection probability. Cases within a group were selected such that the overall group probability was met, but the probability of selection within the group was proportional to each sample member’s second follow-up design weight. Assigning selection probabilities in this way reduced the variability of the third follow-up raw weights and consequently increased the efficiency of the resulting sample from 40.1 to 44.0 percent.

**Fourth Follow-up Survey.** The fourth follow-up student sample was the same as the third follow-up student sample. Data collection for the NELS:88 fourth follow-up survey ended in September 2000, providing a final respondent population of approximately 12,100 individuals.

The Postsecondary Education Transcript Study, conducted as part of the fourth follow-up in 2000, followed those who reported having attended at least

one postsecondary institution according to either the third follow-up survey in 1994 or the fourth follow-up survey in 2000. A total of approximately 9,600 fourth follow-up survey respondents (79 percent of the overall respondent population) reported postsecondary experience since high school. Approximately 21 percent of the NELS:88 respondent population did not participate in postsecondary education.

Within this sample of students, the transcript data collection further targeted students who attended only postsecondary institutions identified in the Integrated Postsecondary Education Data System (IPEDS) institutional data file, thus excluding postsecondary information collected from foreign institutions, non-degree-granting programs, and non-credit-granting institutions. Transcripts were requested from a total of 3,200 postsecondary institutions.

### **Data Collection and Processing**

NELS:88 compiled data from five primary sources: students, parents, school administrators, teachers, and high school administrative records (transcripts, course offerings, and course enrollments). Data collection efforts for the base year through third follow-up extended from spring 1988 through summer 1994. Self-administered questionnaires, cognitive tests, and telephone or personal interviews were used to collect the data. The follow-up surveys involved extensive efforts to locate and collect data from sample members who were school dropouts, school transfers, or otherwise mobile individuals. Coding and editing conventions adhered as closely as possible to the procedures and standards previously established for NLS:72 and HS&B. The contractor National Opinion Research Center (NORC) at the University of Chicago was the prime contractor for the NELS:88 project from the base year through the third follow-up, but Research Triangle Institute conducted the fourth follow-up.

**Reference dates.** In the base-year survey, most questions referred to the student's experience up to the time of the survey administration in spring 1988. In the follow-ups, most questions referred to experiences that occurred between the previous survey and the current survey. For example, the second follow-up largely covered the period between 1990 (when the first follow-up was conducted) and 1992 (when the second follow-up was conducted).

**Data collection.** Prior to each survey, it was necessary to secure a commitment to participate in the study from the administrator of each sampled school. For public schools, the process began by contacting the Council of Chief State School Officers and the officer in each state. Once approval was gained at the state level,

contact was made with district superintendents and then with school principals. For private schools, the National Catholic Educational Association and the National Association of Independent Schools were contacted for endorsement of the project, followed by contact of the school principals. The principal of each cooperating school designated a School Coordinator to serve as a liaison between contractor staff and selected respondents—students, parents, teachers, and the school administrator. The School Coordinator (most often a guidance counselor or senior teacher) handled all requests for data and materials, as well as all logistical arrangements for student-level data collection on the school premises. Coordinators were asked to identify students whose physical or learning disabilities or linguistic deficiencies would preclude participation in the survey and to classify all eligible students as White, Black, Hispanic, Asian/Pacific Islander, or “other” race.

For the base-year through second follow-up surveys, Student Questionnaires and test batteries were primarily administered in group sessions at the schools on a scheduled Survey Day. The sessions were monitored by contractor field staff, who also checked the questionnaires for missing data and attempted data retrieval while the students were in the classroom. Makeup sessions were scheduled for students who were unable to attend the first session. In the first and second follow-ups, off-campus sessions were used for dropouts and for sample members who were not enrolled in a first follow-up school on Survey Day. The School Administrator, Teacher, and Parent Questionnaires were self-administered. Contractor field staff followed up by telephone with individuals who had not returned their questionnaires by mail within a reasonable amount of time.

The first follow-up data collection required intensive tracing efforts to locate base-year sample members who, by 1990, were no longer in their 8<sup>th</sup>-grade schools but had dispersed to many high schools. Also, in order to derive a more precise dropout rate for the 1988 8<sup>th</sup>-grade cohort, a second data collection was undertaken 1 year later, in spring 1991. At this time, an attempt was made to administer questionnaires—by telephone or in person—to sample members who had missed data collection at their school or who were no longer enrolled in school. The first follow-up also included the Base-Year Ineligible (BYI) Study, which surveyed a sample of students considered ineligible in the base year due to linguistic, mental, or physical deficiencies. The BYI Study sought to determine if eligibility status had changed for the excluded students so that newly eligible students could be added to the longitudinal sample. If an excluded student was now eligible, an

abbreviated Student Questionnaire or a Dropout Questionnaire was administered, as appropriate. For those students who were still ineligible, their school enrollment status was ascertained and basic information about their sociodemographic characteristics was recorded.

Tracing efforts continued in the second and third follow-ups. In the second follow-up (conducted in 1992), previously excluded students were surveyed through the Followback Study of Excluded Students. The second follow-up also collected transcript, course offerings, and course enrollments from the high schools; reminder postcards were sent to principals who did not respond within a reasonable period. Data collection for the High School Effectiveness Study (HSES) was conducted concurrently with the collection for the second follow-up. Because of the overlap in school and student samples, survey instruments and procedures for the HSES were almost identical to those used in the NELS:88 second follow-up survey.

By 1994, when the third follow-up was conducted, most sample members had graduated from high school and it was no longer feasible to use group sessions to administer Student Questionnaires. Instead, the dominant form of data collection was one-on-one administration through computer-assisted telephone interviewing (CATI). In-person interviews were used for sample members who required intensive in-person locating or refusal conversion. Only the Student Questionnaire was administered in the third follow-up.

By 2000, when the fourth follow-up was conducted, most sample members who attended college and technical schools had completed their postsecondary education. Data collection for the fourth follow-up survey was conducted almost exclusively with computer-assisted interviewing, primarily by telephone (i.e., using CATI). However, in-person field interviews were also completed with this technology. Field interviewers used the same computer-assisted interview and online coding software as the study's telephone interviewers, but on a laptop computer-based platform (i.e., computer-assisted personal interviewing, or CAPI). Thus, all of the entry of interview data was accomplished by the NELS:88 fourth follow-up CATI-CAPI system.

High school transcripts were collected as part of the second follow-up. The groundwork for the collection of high school transcripts was laid in the spring and fall of 1991, during pre-data collection activities for the second follow-up. Principals were asked to provide any materials—such as course catalogs, student

manuals or handbooks, course lists, and registration forms—that would aid transcript course coding. In August 1992, transcript survey materials were mailed to the principals of the NELS:88 and non-NELS:88 schools attended or most recently attended by sample members eligible for the survey. Two weeks after survey materials were mailed, nonresponding principals were prompted for the return of transcripts with a postcard reminder. Principals who did not return transcripts within 3 weeks of the postcard prompt were prompted over the telephone. Telephone prompting of nonresponding principals continued from October 1992 through February 1993. Field visits to schools requesting assistance in the preparation of transcripts were conducted in February and March.

The Postsecondary Education Transcript Study was carried out at the conclusion of CATI and CAPI data collection for the fourth follow-up survey. Data collection began in September 2000, and over the next 5 months project staff requested transcripts from postsecondary institutions that NELS:88 fourth follow-up respondents reported attending during either the NELS:88 third follow-up or NELS:88 fourth follow-up studies. Requests for transcripts were sent to the registrars or other contacts at the schools. Telephone follow-up with nonresponding institutions took place 2 weeks after transmission of the package. Data collection procedures were designed to follow, where possible, each institution's typical procedures for producing and distributing student transcripts. Returned transcripts and related school catalogs and bulletins were inventoried, transcript identification numbers affixed to each, and unique identifying information removed.

**Processing.** Data processing activities were quite similar for the base-year survey and the first and second follow-ups. An initial check of student documents for missing data was performed on-site by contractor staff so that data could be retrieved from the students before they left the classroom. Special attention was paid to a list of "critical items." Once the questionnaires and tests were received at the contractor, they were again reviewed for completeness, and a final disposition code was assigned to the case indicating which documents had been completed by the sample member. Postsecondary institutions reported by the student were coded using the standard IPEDS codes. Data entry for both Student Questionnaires and cognitive tests was performed through optical scanning. New Student Supplements and Dropout Questionnaires were converted to machine-readable form using key-to-disk methods. All cognitive tests were photographed onto microfilm for archival storage.

In the third follow-up, a CATI system captured the data at the time of the interview. The system evaluated the responses to completed questions and used the results to route the interviewer to the next appropriate question. The CATI program also applied the customary edits, described below under “Editing.” At the conclusion of an interview, the completed case was deposited in the database ready for analysis. There was minimal post-data entry cleaning because the interviewing module itself conducted the majority of necessary edit checking and conversion functions.

Verbatim responses were collected in the third follow-up for a number of items, including occupation and major field of study. When respondents indicated their occupation, the CATI interviewers recorded the verbatim response. The system checked the response using a keyword search to match it to a subset of standard industry and occupation codes, and then presented the interviewer with a set of choices based on the keyword matches. The interviewer chose the option which most closely matched the information provided by the respondent, probing for additional information when necessary. Quality control was ensured by a reading and recoding, if necessary, of the verbatim responses by professional readers.

In the fourth follow-up, data were collected and edited almost exclusively with computer-assisted interviewing, primarily by telephone (i.e., using CATI).

For the High School Transcript Study, student- and course-level data were abstracted from transcripts. Transcript courses were coded using the course catalog for the school or district, in accordance with the Classification System of Secondary Courses, updated for the 1990 NAEP High School Transcript Study. When a school or district catalog was unavailable, courses were coded by title alone.

Information from the postsecondary education transcripts, including terms of attendance, fields of study, specific courses taken, and grades and credits earned, was coded and processed using a transcript control system developed specifically for this purpose. Specially trained research personnel then coded and tabulated these academic documents.

**Editing.** In the base-year through second follow-up surveys, detection of out-of-range codes was completed during scanning or data entry for all closed-ended questions. Machine editing was used to (1) resolve inconsistencies between filter and dependent questions; (2) supply appropriate missing data codes for questions left blank (e.g., legitimate skip, refusal); (3) detect illegal codes and convert them to missing

data codes; and (4) investigate inconsistencies or contradictions. Frequencies and cross-tabulations for each variable were inspected before and after these steps to verify the accuracy and appropriateness of the machine editing. Items with unusually high nonresponse or multiple responses were further checked by verifying the responses on the questionnaire. A final editing step involved recoding Student Questionnaire responses for some items to the codes for the same items in earlier NELS:88 waves or in HS&B. Once this was done, codes that differed in the Dropout Questionnaire were recoded to coincide with the codes used for Student Questionnaire responses.

In the third and fourth follow-ups, machine editing was replaced by the interactive edit capabilities of the CATI system, which tested responses for valid ranges, data field size, data type (numeric or text), and consistency with other answers or data from previous rounds. If the system detected an inconsistency because of an interviewer’s incorrect entry, or if the respondent simply realized that he or she had made a reporting error earlier in the interview, the interviewer could go back and change the earlier response. As the new response was entered, all of the edit checks performed at the first response were again performed. The system then worked its way forward through the questionnaire using the new value in all skip instructions, consistency checks, and the like until it reached the first unanswered question, and control was then returned to the interviewer. When problems were encountered, the system could suggest prompts for the interviewer to use to elicit a better or more complete answer.

### **Estimation Methods**

Sample weighting is required so that NELS:88 data are representative of the full population. Imputation for missing nonresponses, however, has not yet been systematically provided for data analysis.

**Weighting.** Weighting is used in NELS:88 data analysis to accomplish a number of objectives, including (1) expanding counts from sample data to full population levels; (2) adjusting for differential selection probabilities (e.g., the oversampling of Asian and Hispanic students); (3) adjusting for differential response rates; and (4) improving representativeness by using auxiliary information. Multiple “final” (or nonresponse-adjusted) weights have been provided for analyzing the different populations that NELS:88 data represent (i.e., base-year schools; 8<sup>th</sup>-graders in 1988 and 2, 4, 6, and 12 years later; 1990 sophomores; 1992 seniors; and 2000 college graduates). Weights should

be used together with the appropriate flag in order to analyze the sample for a particular targeted population.

Weights have not been constructed for all possible analytic purposes. In cases where no specific weight is available, existing weights may provide reasonable approximations. For instance, base-year parent and cognitive test completion rates were so high relative to Student Questionnaire completion that the student weight can be used for them with minimal bias.

NELS:88 weights were calculated in two steps: (1) unadjusted weights were calculated as the inverse of the probabilities of selection, taking into account all stages of the sample selection process; and (2) these initial weights were adjusted to compensate for nonresponse, typically carried out separately within multiple weighting cells. For detailed discussions of the calculation of weights for each wave, users are referred to the methodology reports for the individual surveys.

**Scaling (Item Response Theory).** Item Response Theory (IRT) was used to calibrate item parameters for all cognitive test items administered to students in NELS:88 tests. The tests conducted in each NELS:88 survey generated achievement measures in standardized scores.

**Imputation.** NELS:88 surveys have not involved large-scale imputation of missing data. Only a few variables have been imputed: student's sex, race/ethnicity, and school enrollment status. For example, when sex was missing in the data file, the information was looked for in earlier school rosters. If it was still unavailable after this review, sex was assumed from the sample member's name (if unambiguous). As a final resort, sex was randomly assigned.

## 5. DATA QUALITY AND COMPARABILITY

A number of studies have been conducted to address data quality issues relating to the NELS:88 project. During the course of data collection and processing, systematic efforts were made to monitor, assess, and maximize data quality. Subsequently, studies were conducted to evaluate the data quality in NELS:88 in comparison with that in earlier longitudinal surveys.

### Sampling Error

Because the NELS:88 sample design involved stratification, disproportionate sampling of certain strata, and clustered (i.e., multistage) probability sampling, the calculation of exact standard errors (an

indication of sampling error) for survey estimates can be difficult and expensive. For NELS:88, the Taylor series procedure has typically been used to calculate the standard errors.

Standard errors and design effects for about 30 key variables in each NELS:88 wave from the base year through the fourth follow-up were calculated using SUDAAN software. These can be used to approximate the standard errors if users do not have access to specialized software.

**Design effects.** A comparative study of design effects across NELS:88 waves and between NELS:88 and HS&B was done. When comparing NELS:88 base-year Student Questionnaire data to the results from HS&B—the 30 variables from the NELS:88 Student Questionnaire were selected to overlap as much as possible with those variables examined in HS&B—the design effects indicate that the NELS:88 sample was slightly more efficient than the HS&B sample. The smaller design effects in the NELS:88 base year may reflect its smaller cluster size (24 students plus, on average, two oversampled Hispanics and Asian from each NELS:88 school vs. the 36 sophomore and 36 senior selections from each HS&B school). The mean design effect for base-year students is 2.54.

In the comparative study of design effects across NELS:88 waves, the design effects in the subsequent follow-up studies were somewhat higher than those in the base year, a result of the subsampling procedures

used in the follow-ups. The mean design effects for students and dropouts are 3.90 for the first follow-up, 3.70 for the second follow-up, 2.90 for the third follow-up, and 3.90 for the fourth follow-up. See the *NELS:88 Base Year Through Second Follow-up Final Methodology Report* (Ingels et al. 1998) and the *User's Manual: NELS:88 Base-Year to Fourth Follow-up: Student Component Data File* (Curtin et al. 2002).

### Nonsampling Error

**Coverage error.** Exclusion and undercoverage of certain groups of schools and students in NELS:88 generated coverage error. In the base-year survey, for example, students who had linguistic, mental, or physical obstacles were excluded from the study.

Consequently, the national populations for such student groups were not fully covered by the sample.

To correct this coverage bias, the Base-Year Ineligible (BYI) Study collected eligibility information for 93.9 percent of the sample members excluded in the base-year survey. For those who were reclassified as eligible in the BYI Study, Student or Dropout Questionnaires

were administered in person or over the telephone during the first follow-up. Cognitive tests were also administered to a small percentage of these students. For students who remained ineligible, school enrollment status and other key characteristics were obtained. The BYI Study permitted an evaluation of coverage bias in NELS:88 and a means of reducing undercoverage by identifying newly eligible students who could then be added into the sample to ensure cross-sectional representativeness. This effort also provided a basis for making corrected dropout estimates, taking into account both 1988-eligible and 1988-ineligible 8th-graders 2 years later. For further detail on the BYI Study, see *Sample Exclusion in NELS:88: Characteristics of Base Year Ineligible Students; Changes in Eligibility Status After Four Years* (Ingels 1996).

**Nonresponse error.** Both unit nonresponse (nonparticipation in the survey by a sample member) and item nonresponse (missing value for a given questionnaire/test item) have been evaluated in NELS:88 data.

**Unit nonresponse.** In the NELS:88 base-year survey, the initial school response rate was 69 percent. This low rate prompted a follow-up survey to collect basic characteristics from a sample of the nonparticipating schools. These data were then compared to the same characteristics among the participating schools to assess the possible impact of response bias on the survey estimates. The school-level nonresponse bias was found to be small to the extent that schools could be characterized by size, control, organizational structure, student composition, and other factors. Bias at the school level was not assessed for the follow-up surveys because (1) sampling for the first and second follow-ups was student-driven (i.e., the schools were identified by following student sample members) and the third and fourth follow-ups did not involve schools; and (2) school cooperation rates were very high (up to 99 percent). Even if a school refused to cooperate, individual students were pursued outside of school (although school context data were not collected). The student response rates are shown in table 5.

Student-level nonresponse analysis was conducted with a focus on *panel nonresponse* since a priority of the NELS:88 project is to provide a basis for longitudinal analysis. Nonresponse was examined for the 8<sup>th</sup>-grade and 10<sup>th</sup>-grade cohorts. Any member of the 8<sup>th</sup>-grade cohort who did not complete a survey in three rounds (base year, first follow-up, and second follow-up) and any member in the 10<sup>th</sup>-grade cohort who did not complete a survey in the second and third rounds (first and second follow-ups) was considered a

panel nonrespondent for that cohort. Panel nonresponse to cognitive tests in the two cohorts was defined the same way. The nonresponse rate was defined as the proportion of the selected students (excluding deceased students) who were nonrespondents in any round in which data were collected.

Nonresponse rates for both cohorts were calculated by school- and student-level variables that were assumed to be stable across survey waves (e.g., sex and race). These variables allowed comparisons between participants and nonparticipants even though the data for the latter were missing in some rounds. Estimates were made with both weighted and unweighted data. The weight used was the second follow-up raw panel weight (not available in the public-release dataset). About 18 percent of the 8<sup>th</sup>-grade cohort and 10 percent of the 10<sup>th</sup>-grade cohort were survey nonrespondents at one or more points in time. Approximately 43 percent of the 8<sup>th</sup>-grade cohort and 35 percent of the 10<sup>th</sup>-grade cohort did not complete one or more cognitive tests in their rounds of testing.

Nonresponse bias was calculated as the difference in the estimates between the respondents and all selected students. On the whole, the analysis revealed only small discrepancies between the two cohorts. Bias estimates were higher, however, for the 8<sup>th</sup>-grade cohort than for the 10<sup>th</sup>-grade cohort because of the 8<sup>th</sup>-grade cohort's more stringent definition of participation. The discrepancies between cognitive test completers and noncompleters were larger than between survey participants and nonparticipants; this pattern held for both cohorts. In brief, the magnitude of the bias was generally small—few percentage estimates were off by as much as 2 percent in the 8<sup>th</sup>-grade cohort and 1 percent in the 10<sup>th</sup>-grade cohort. Such bias reflects the raw weight. The nonresponse-adjusted weight should correct for differences by race and sex to produce correct population estimates for each subgroup.

Further analysis was done using several other student and school variables. The results showed rather similar patterns of bias. When compared with estimates from HS&B, the student nonresponse bias estimates in NELS:88 were consistently lower. However, the two studies seem to share certain common patterns of nonresponse. For example, both studies generated comparatively higher nonresponse rates among students enrolled in schools in the West, Black students, students in vocational or technical programs, students in the lowest test quartile, and dropouts.

*Item nonresponse.* Item nonresponse was examined in base-year through second follow-up data obtained from surveys of students, parents, and teachers. Differences emerged among student subgroups in the level of nonresponse to a wide range of items—from language background, family composition, and parents' education to perception of school safety. Nonresponse was often two to five times as great for one subgroup as for the other subgroups. High item nonresponse rates were associated with such attributes as not living with parents, having low SES, being male, having poor reading skills, and being enrolled in a public school. Compared with parent nonresponse to items about college choice and occupational expectations, student nonresponse rates were generally lower. For items about student's language proficiency, classroom practices, and student's high school track, students had consistently lower nonresponse rates than their teachers did. See the *NELS:88 Survey Item Evaluation Report* (McLaughlin, Cohen, and Lee 1997) for further detail.

**Measurement error.** NCES has conducted studies to evaluate measurement error in (1) student data (compared to parent and teacher data); and (2) student cognitive test data.

*Parent-student convergence and teacher-student convergence.* A study of measurement error in data from the base-year through second follow-up surveys focused on the convergence of responses by parents and students and by teachers and students. (See the *NELS:88 Survey Item Evaluation Report* [McLaughlin, Cohen, and Lee 1997].) Response convergence (or discrepancy) across respondent groups can be interpreted as an indication of measurement reliability, validity, and communality, although the data are often not sufficient to determine which response is more accurate.

The student and parent components of this study covered such variables as number of siblings, the student's work experience, language background, parents' education, parent-student discussion of issues, perceptions about school, and college and occupation expectations. Parent-student convergence varied from very high to very low, depending on the item. For example, convergence was high for number of siblings, regardless of student-level characteristics such as SES, sex, reading scores, public versus private school enrollment, and whether or not living with parents. In contrast, parent-student convergence was low for items related to the student's work experience; there was also more variation across student subgroups for these items. In general, convergence tended to be

high for objective items, for items worded similarly, and for nonsensitive items.

Teacher-student convergence was examined through variables about student's English proficiency, classroom practices, and student's high school track. Again, convergence was found to vary considerably across data items and student subgroups. Convergence was high for student's native language but low for student's English proficiency. Across student subgroups, there was a greater range in correlations for English proficiency than for native language. Teachers and students differed quite dramatically on items about classroom practices.

*Cognitive test data.* In-depth studies of measurement error issues related to cognitive tests administered in the base-year through second follow-up surveys are also available. See the *Psychometric Report for the NELS:88 Base Year Test Battery* (Rock and Pollack 1991) and the *Psychometric Report for the NELS:88 Base Year Through Second Follow-up* (Rock and Pollack 1995).

The first study (Rock and Pollack 1991) addressed issues related to test speediness (the limited testing time in relation to the outcome), reliability, item statistics, performance by racial/ethnic and gender groups, and IRT parameters for the battery. The results indicate that the test battery either met or exceeded all of its psychometric objectives. Specifically, the study reported: (1) while the allotted testing time was only 1½ hours, quite acceptable reliability was obtained for the tests on reading comprehension, mathematics, history/citizenship/ geography, and, to a somewhat lesser extent, science; (2) the internal consistency reliability was sufficiently high to justify the use of IRT scoring and, thus, provide the framework for constructing 10<sup>th</sup>- and 12<sup>th</sup>-grade forms that would be adaptive to the ability levels of the students; (3) there was no consistent evidence of differential item functioning (item bias) for gender or racial/ethnic groups; (4) factor analysis results supported the discriminant validity of the four tested content areas; convergent validity was also indicated by salient loadings of testlets composed of "marker items" on their hypothesized factors; and (5) in addition to providing the usual normative scores in all four tested areas, behaviorally anchored proficiency scores were provided in both the reading and math areas.

The second study (Rock and Pollack 1995) focused on issues relating to the measurement of gain scores. Special procedures were designed into the test battery design and administration to minimize the floor and ceiling effects that typically distort gain scores. The

battery used a two-stage multilevel procedure that attempted to tailor the difficulty of the test items to the performance level of a particular student. Thus, students who performed very well on their 8<sup>th</sup>-grade mathematics test received a relatively more difficult form in 10<sup>th</sup> grade than students who had not performed well on their 8<sup>th</sup>-grade test. There were three forms of varying difficulty in mathematics and two in reading in both grades 10 and 12. Since 10<sup>th</sup>- and 12<sup>th</sup>-graders were taking forms that were more appropriate for their level of ability and achievement, measurement accuracy was enhanced and floor and ceiling effects could be minimized. The remaining two content areas—science and history/citizenship/geography—were only designed to be grade-level adaptive (i.e., a different form for each grade but not multiple forms varying in difficulty within grade).

To maximize the gain from using an adaptive procedure, special vertical scaling procedures were used that allow for Bayesian priors on subpopulations for both item parameters and scale scores. In comparing more traditional non-Bayesian approaches to scaling longitudinal measures with the Bayesian approach, it was found that the multilevel approach did increase the accuracy of the measurement. Furthermore, when used in combination with the Bayesian item parameter estimation, the multilevel approach reduced floor and ceiling effects when compared to the more traditional IRT approaches.

### **Data Comparability**

NELS:88 is designed to facilitate both longitudinal and trend analyses. Longitudinal analysis calls for data compatibility across survey waves whereas trend analysis requires data compatibility with other longitudinal surveys. Data compatibility issues may relate to survey instruments, sample design, and data collection methods.

#### ***Comparability within NELS:88 across survey waves.***

A large number of variables are common across survey waves. (See the *NELS:88 Second Follow-up Student Component Data File User's Manual* [Ingels et al. 1994] for a listing of common Student Questionnaire variables in the base year, first follow-up, and second follow-up.) However, compatibility of NELS:88 data across waves can still be an issue because of subtle differences in question wording, sample differences (e.g., with or without dropouts and freshening students, sample attrition, nonresponse), and data collection methods (e.g., on-campus group session, off-campus individual survey, telephone interview).

One NCES study compared 112 pairs of variables repeated from the base year to the first and second

follow-up surveys. (See the *NELS:88 Survey Item Evaluation Report* [McLaughlin, Cohen, and Lee 1997].) These variables cover student family, attitudes, education plans, and perceptions about schools. The results suggest that the interpretations of NELS:88 items depend on the age level at which they were administered. Data convergence tended to be higher for pairs of first and second follow-up measures than for pairs of base-year and second follow-up measures. Some measures were more stable than others. Students responded nearly identically to the base-year and second follow-up questions about whether English was their native language. Their responses across survey waves were also fairly stable as to whether their curriculum was intended to prepare them for college, whether they planned to go to college, and their religiosity. It should be noted that cross-wave discrepancies may reflect a change in actual student behavior rather than a change in response for a status quo situation.

#### ***Comparability within NELS:88 across respondent groups.***

While different questionnaires were used to collect data from different respondent groups (students, parents, teachers, school administrators), there are overlapping items among these instruments. One study examined the extent to which the identical or similar items in different questionnaires generated compatible information. It found considerable discrepancies between students and parents, and even greater discrepancies between students and teachers, in their responses to selected groups of overlapping variables. (See “Measurement error” above.)

#### ***Comparability with NLS:72, HS&B, and ELS:2002.***

NELS:88 surveys contain many items that are also covered in NLS:72, HS&B, and ELS:2002—a feature that enables trend analyses of various designs. (See the *NELS:88 Second Follow-up Student Component Data File User's Manual* [Ingels et al. 1994] for a cross-walk of common variables and a discussion of trend analyses.) To examine data compatibility across the four studies, one should consider their sample designs and data contents, including questionnaires, cognitive tests, and transcript records.

*Sample designs* for the four studies are similar. In each base year, students were selected through a two-stage stratified probability sample, with schools as the first-stage units and students within schools as the second-stage units. In NLS:72, all baseline sample members were spring term 1972 high school seniors. In HS&B, all members of the student sample were spring term 1980 sophomores or seniors. In ELS:2002, the base-year sample students were 10<sup>th</sup>-graders. Because NELS:88 base-year sample members were 8<sup>th</sup>-graders

in 1988, its follow-ups encompass students (both in the modal grade progression sequence and out of sequence) and dropouts. Sample freshening was used in NELS:88 to provide cross-sectional nationally representative samples. Despite similarities, however, the sample designs of the four studies differ in three major ways: (1) the NELS:88 first and second follow-ups had relatively variable, small, and unrepresentative within-school student samples, compared to the relatively uniform, large, and representative within-school student samples in NLS:72 and HS&B; (2) unlike the two earlier studies, NELS:88 did not provide a nationally representative school sample in its follow-ups; and (3) there were differences in school and subgroup sampling and oversampling strategies in the four studies. These sample differences imply differences in the respondent populations covered by the four studies.

*Questionnaire* overlap is apparent among the four studies; nevertheless, caution is required when making trend comparisons. Some items were repeated in identical form across the studies; others appear to be essentially similar but have small differences in wording or response categories.

IRT scaling was used in the four studies to put math, vocabulary, and reading *test scores* on the same scale for 1972, 1980, 1982, and 2002 seniors. Additionally, there were common items in the HS&B and NELS:88 math tests that provide a basis for equating 1980–1990 and 1982–1992 math results, and common items in the NELS:88 and ELS:2002 reading and math tests that

provide the link to obtain the ELS:2002 student ability estimates on the NELS:88 ability scale. In general, however, the tests in the four studies differed in many ways. Although group differences by standard deviation units may profitably be examined, caution should be exercised in drawing time-lag comparisons for cognitive test data.

*Transcript studies* in NELS:88, HS&B, ELS:2002, and NAEP were designed to support cross-cohort comparisons. The ELS:2002, NAEP, and NELS:88 studies, however, provide summary data in Carnegie units, whereas HS&B provides course totals. Note too that course offerings were only collected from schools that were part of the High School Effectiveness Study in the NELS:88 second follow-up, whereas course offerings were collected from *all* schools in HS&B (see HS&B chapter), and course offerings were collected from all base-year schools and the last school attended by sample members who transferred out of their base-year school in ELS:2002 (see ELS chapter).

Other factors should also be considered in assessing data compatibility. Differences in mode and time of survey administration across the cohorts may affect compatibility. NELS:88 seniors were generally surveyed earlier in the school year than were NLS:72 seniors. NLS:72 survey forms were administered by school personnel while HS&B and NELS:88 survey forms were administered primarily by contractor staff. There were also differences in questionnaire formats; the later tests had improved mapping and different answer sheets.

**Table 5. Unit-level and overall weighted response rates for selected NELS:88 student populations, by data collection wave**

Population	Unit-level weighted response rate					
	Base-year school level	Base-year student level	1st follow-up	2nd follow-up	3rd follow-up	4th follow-up
Interviewed students	69.7 <sup>1</sup>	93.4	91.1	91.0	90.9	82.1
Tested students	69.7 <sup>1</sup>	96.5	94.1	76.6	†	†
Dropouts	69.7 <sup>1</sup>	†	91.0	88.0	†	†
Tested dropouts	69.7 <sup>1</sup>	†	48.6	41.7	†	†

  

Population	Overall weighted response rate					
	Base-year school level	Base-year student level	1st follow-up	2nd follow-up	3rd follow-up	4th follow-up
Interviewed students	69.7 <sup>1</sup>	65.1	63.5	63.4	63.4	57.2
Tested students	69.7 <sup>1</sup>	67.3	65.6	53.4	†	†
Dropouts	69.7 <sup>1</sup>	†	63.4	61.3	†	†
Tested dropouts	69.7 <sup>1</sup>	†	33.9	29.1	†	†

† Not applicable.

<sup>1</sup>Unweighted response rate.

SOURCE: Curtin, T.R., Ingels, S.J., Wu, S., and Heuer, R. (2002). *User's Manual: NELS:88 Base-Year to Fourth Follow-up: Student Component Data File* (NCES 2002-323). National Center for Education Statistics, U.S. Department of Education. Washington, DC. Spencer, B.D., Frankel, M.R., Ingel, S.J., Rasinski, K.A., and Tourangeau, R. (1990). *NELS:88 Base-Year Sample Design Report* (NCES 90-463). National Center for Education Statistics, U.S. Department of Education. Washington, DC.

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