Editorial Note

National Center for Education Statistics

The National Center for Education Statistics (NCES) fulfills a congressional mandate to collect and report "statistics and information showing the condition and progress of education in the United States and other nations in order to promote and accelerate the improvement of American education."

Education Statistics Quarterly

Purpose and goals

At NCES, we are convinced that good data lead to good decisions about education. The *Education Statistics Quarterly* is part of an overall effort to make reliable data more accessible. Goals include providing a quick way to

- identify information of interest;
- review key facts, figures, and summary information; and
- obtain references to detailed data and analyses.

Content

The *Quarterly* gives a comprehensive overview of work done across all parts of NCES. Each issue includes short publications, summaries, and descriptions that cover all NCES publications and data products released during a 3-month period. To further stimulate ideas and discussion, each issue also incorporates

- a message from NCES on an important and timely subject in education statistics; and
- a featured topic of enduring importance with invited commentary.

A complete annual index of NCES publications appears in the Winter issue (published each January). Publications in the *Quarterly* have been technically reviewed for content and statistical accuracy.

General note about the data and interpretations

Many NCES publications present data that are based on representative samples and thus are subject to sampling variability. In these cases, tests for statistical significance take both the study design and the number of comparisons into account. NCES publications only discuss differences that are significant at the 95 percent confidence level or higher. Because of variations in study design, differences of roughly the same magnitude can be statistically significant in some cases but not in others. In addition, results from surveys are subject to nonsampling errors. In the design, conduct, and data processing of NCES surveys, efforts are made to minimize the effects of nonsampling errors, such as item nonresponse, measurement error, data processing error, and other systematic error.

For complete technical details about data and methodology, including sample sizes, response rates, and other indicators of survey quality, we encourage readers to examine the detailed reports referenced in each article.

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Jeffrey Owings, Associate Commissioner,
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Longitudinal Studies at NCES

My career in the federal government began on a high note—I was offered a position that enabled me to work on the Longitudinal Studies Program at the National Center for Education Statistics (NCES). I was being given the opportunity to take an active role in helping to design studies that collected data from nationally representative samples of students over selected periods of time. This is where the action was at NCES—this is where I wanted to be.

Although my job description at NCES has changed several times in the past 22 years—from education statistician to program officer to program director and, most recently, to associate commissioner—I am still closely associated with longitudinal studies. On a daily basis, I review questionnaires, examine participation rates, and make decisions that I hope will help NCES to produce user-friendly data sets that provide researchers with data that can be used to tell the stories of both those students who thrive in the education system and those who fail. There are also the stories of students who, judging by their home and academic background, are projected to fail, but instead choose a path that leads to success.

During my 22 years at NCES, I have been associated with four major longitudinal studies that follow students through high school into postsecondary education and/or the world of work. These are the

- National Longitudinal Study of the High School Class of 1972 (NLS:72)—a cohort of 12th-graders that was followed for 14 years;
- High School and Beyond Longitudinal Study (HS&B)—a cohort of 1980 high school sophomores and a cohort of 1980 high school seniors that were followed through the 1980s;
- National Education Longitudinal Study of 1988 (NELS:88)—a cohort of eighth-graders in 1988 that was followed through the year 2000; and
- Education Longitudinal Study of 2002 (ELS:2002)—a cohort of 10th-graders that will be followed between the years 2002 and 2014.

As can be seen from the above, NCES has been in the business of collecting longitudinal data from 1972 to the present. During this time period, data have been collected from students as well as from their parents, teachers, and school principals. Depending on the cohort, data have also been collected from extant records such as high school and postsecondary transcripts.

Unlike most cross-sectional studies, which have a limited life due to the age of the data collected, the usefulness of longitudinal studies for research is extended over time. In fact, longitudinal data can be used to conduct cross-sectional (single point in time), longitudinal (across time with the same individuals), or trend (between different cohorts) analyses. The story told in the featured article of this issue of the *Education Statistics Quarterly*—an excerpt from the NCES report *Coming of Age in the 1990s: The Eighth-Grade Class of 1988 12 Years Later*—is longitudinal—a cohort of eighth-graders from NELS:88 is examined in 1988 and then again in the year 2000. Because NELS:88 followed a group of eighth-graders for 12 years, it is possible to associate past events with later educational and occupational outcomes.

The members of this eighth-grade cohort were born at the end of the Vietnam War (1974), when handheld calculators were not used with great frequency and personal computers had just been invented. They grew up, though, in an era that experienced numerous changes in the fields of communication, technology, medicine, and transportation that influenced their day-to-day lives. They experienced explosive growth in the computer industry and participated in secondary and postsecondary education on the threshold of a new millennium dominated by personal computers. Given the rapidly paced society in which this cohort matured, some questions naturally arise: Have these individuals been prepared for the 21st century? How much education do they have? What occupations are they entering? Are they starting families? *Coming of Age in the 1990s* provides insight into these kinds of questions.

Over 12,000 eighth-graders were surveyed both in the base year (1988) and in the fourth follow-up (2000) of NELS:88. Their responses were coded and then analyzed. Using the findings of these analyses, a story has been told about their lives—both the successes and the failures. In telling such stories, longitudinal studies have an advantage over cross-sectional studies because they provide both background and outcome variables. The background variables (e.g., family characteristics, eighth-grade courses) can be used to predict later outcomes such as college or career success. Background variables do not always work well as predictors, however. For example, there are always groups of students who succeed when background variables suggest a higher risk of failure. There are also groups of students who fail (e.g., drop out of high school) when advantaged backgrounds suggest more favorable outcomes. These kinds of stories (both predictable and non-predictable) can be used by researchers, policymakers, schools, and parents to better inform decisions regarding the education experiences that are selected for our nation's youth. The featured article takes a first look at the year 2000 outcomes experienced by the eighth-grade class of 1988.

Featured Topic: National Education Longitudinal Study of 1988 (NELS:88)

Coming of Age: 12 Years Later

Coming of Age in the 1990s: The Eighth-Grade Class of 1988 12 Years Later

Steven J. Ingels, Thomas R. Curtin, Phillip Kaufman, Martha Naomi Alt, and Xianglei Chen

This article was originally published as the Executive Summary of the Statistical Analysis Report of the same name. The sample survey data are from the National Education Longitudinal Study of 1988 (NELS:88).

This report examines the eighth-grade cohort of 1988 in the year 2000. It presents findings from the fourth follow-up survey of the National Education Longitudinal Study of 1988 (NELS:88). This follow-up was conducted in 2000, the year when most eighth-grade cohort members turned 26.

First surveyed in the spring term of the 1987–88 school year, the eighth-grade cohort provided information about its school experiences, as well as educational and occupational aspirations, and completed achievement tests in mathematics, reading, science, and social studies. The eighth-grade class of 1988 reported high educational aspirations. Some 66 percent planned to complete a bachelor's degree or higher (Hafner et al. 1990). Parental expectations for their eighth-graders' higher education were also quite high. More than three-quarters of all parents (78 percent) expected their eighth-graders to attend college, and 58 percent expected them to finish (38 percent expected college graduation to be their eighth-graders' highest educational attainment while 20 percent expected their eighth-graders to earn a postbaccalaureate academic or professional degree) (Horn and West 1992). The 1988 eighth-grade class was surveyed again in four follow-ups: in 1990, 1992, 1994, and 2000. Data from the follow-up interview in 2000 permit us to see what this cohort had accomplished 12 years after the eighth-grade baseline survey.

In trying to understand the later outcomes of the eighth-grade class of 1988, it may be helpful to review some of the educational, societal, and economic trends and developments that helped to form the context in which members of this cohort developed and made choices. The period during which this cohort attended elementary, middle, and secondary school saw major initiatives of the American school reform movement, including raising of graduation requirements and mandating of student testing standards (Medrich, Brown, and Henke 1992). With the reauthorization of the Higher Education Act in 1992, the period after this cohort's graduation from high school benefited from high levels of support for students in postsecondary education (Berkner 1998), with increases in both grants and loans, but particularly the latter. Student loan volume more than doubled between 1990 and 2000, and the number of loans made annually doubled as well; the largest increases were in the period 1993–98 (American Council on Education 2001).

In addition to educational influences, various social and economic forces may have affected the cohort as well. Within the strong American economy of the 1990s, the rate of economic return to college degrees outpaced the return to high school diplomas (Boesel and Fredland 1999). New technologies, particularly developments in computing, also marked the American economy in the 12 years (1988–2000) between the first and the final interviews of this cohort.

The 2000 data were collected at a key stage of life transitions for the eighth-grade class of 1988—most had been out of high school for nearly 8 years. Many had already completed postsecondary education, started or even changed careers, and started to form families.

The report begins with a look at the cohort's high school completion status in 2000. It next examines its postsecondary attainment and experiences. It also reports on the cohort's labor market experiences as of 2000, including employment, occupational fields, job satisfaction, use of computers, job training, income, and receipt of public aid. Next, the report looks at the current activities of cohort members with varying degrees of educational attainment—those with no postsecondary education, those with some postsecondary education, and those with a bachelor's or higher degree. Finally, the report examines the cohort's family formation (marital and parental status) and other activities (e.g., citizenship and community service activities, computer use, reading patterns).

High School Completion

By 2000, most members of the 1988 eighth-grade cohort (83 percent) had earned a high school diploma. An additional 9 percent had earned an alternative credential by passing the General Educational Development (GED) tests, and 8 percent had dropped out of high school and failed to complete by either method.

Among eighth-grade cohort members who had not completed high school by 2000, 14 percent reported that they were currently enrolled in school and working toward a high school diploma, GED, or attendance certificate.[1] Earning a GED can open educational opportunities that dropouts largely lack, since most colleges and universities accept the GED as a basis for admission (National Center for Education Statistics 2000).

Cohort members from advantaged backgrounds (having high–socioeconomic status [SES] families, parents with bachelor's or higher degrees, mothers who expected them to graduate from college, and no dropout risk factors) were more likely than those from disadvantaged backgrounds (having low-SES families, parents who did not attend college, mothers who did not expect them to graduate from college, or one or more dropout risk factors[2]) to graduate from high school with a diploma, and less likely to complete high school with a GED or to drop out of high school.

High school completion rates at the time of the interview (early in 2000) were related to educational experiences before high school, in addition to personal and background characteristics. Cohort members who, in eighth grade, exhibited high mathematics achievement (i.e., scored in the highest quartile of the NELS:88 mathematics test), studied algebra, attended a private school, or participated in extracurricular activities were more likely to graduate from high school with a diploma and generally less likely to complete high school with a GED or to drop out than were their counterparts with different academic characteristics in eighth grade. Mathematics achievement in particular, as measured in eighth grade, was associated with the

[1] A certificate of high school attendance may be awarded when a student attended high school for the minimum amount of time required but did not complete all courses required for a diploma. A General Educational Development (GED) certificate is awarded to those who did not finish high school but who have earned the equivalent of a high school diploma by passing required GED exams.

[2] Six risk factors (at eighth grade) were identified and included in the at-risk variable: living in a single-parent household; having neither parent complete high school; having an older sibling who dropped out of high school; being home alone after school more than 3 hours a day; being limited English proficient; and being in a low-income family (less than $15,000 annual income in 1987). Socioeconomic status (SES) is a composite variable; some SES components (family income, parent education) are also components of the at-risk variable .

likelihood both of earning a diploma and of not dropping out of high school.

Postsecondary Attainment and Experiences

By 2000, 8 years after most had graduated from high school, 29 percent of the 1988 eighth-grade cohort reported that they had attained a bachelor's degree or higher. Nearly 47 percent of the cohort reported that they had gained some postsecondary credits but had earned either no credential or one below a bachelor's degree (an associate's degree or certificate[3]). The remaining 24 percent of cohort members had not enrolled in any postsecondary education after high school.

This report examines the relationship between postsecondary attainment by 2000 and both background factors (specifically, sex, familial advantage or disadvantage, and race/ethnicity) and factors related to schooling at eighth grade. Consistent with sex differences noted in recent work (Clune, Nuñez, and Choy 2001), females in the 1988 eighth-grade cohort were more likely than males to report that they had earned a bachelor's or higher degree by 2000 and were less likely to report that they had not enrolled in postsecondary education. In addition, disadvantaged cohort members—those from low-SES families, whose parents did not have a college education, whose mothers did not expect them to complete college, or who had risk factors for dropping out of high school—were less likely than those without such characteristics to report that they had earned a bachelor's or higher degree and more likely to report that they had not enrolled in postsecondary education.

Among cohort members, Asians/Pacific Islanders had a higher postsecondary enrollment rate (95 percent) than Whites (77 percent), Blacks (77 percent), Hispanics (70 percent), American Indians/Alaska Natives (66 percent), and those with multiracial backgrounds (76 percent).[4] Moreover, Asians/Pacific Islanders were more likely than any other racial/ethnic group in the cohort to indicate earning a bachelor's degree by 2000.

In addition to examining the relationship between postsecondary attainment by 2000 and 1988 eighth-grade background factors, this report also examines the relationship between school experience at eighth grade and later postsecondary attainment. Cohort members who attended a private school, demonstrated high mathematics achievement, took an algebra course, or participated in extracurricular activities as eighth-graders reported higher postsecondary enrollment rates and bachelor's/higher degree attainment rates than did their counterparts who lacked these school experiences in eighth grade.

Labor Market Experiences

Employment

In spring 2000—a time of historically high employment rates in a rapidly growing economy—about 86 percent of the cohort were employed for pay in a full- or part-time job. High school graduates were more likely than their peers who had not obtained a high school diploma to be employed: 88 percent of high school graduates were employed for pay, whereas 78 percent of GED recipients and 79 percent of school dropouts were employed. In 2000, although the vast majority of cohort members of both sexes were employed, a larger proportion of males than of females were working—92 percent versus 81 percent.

Occupational fields

Of 1988 eighth-grade cohort members working full- or part-time for pay in 2000, many were mechanics or laborers (22 percent); business and management workers (21 percent); or administrative, legal, or clerical support employees (17 percent). Females were more likely than males to be educators and to work in business/management; medical professions; administrative, legal, or clerical support; and service industries. Males were more likely than females to work as engineers, architects, or software professionals; computer scientists; researchers or scientists; and mechanics or laborers.

Educational attainment and skills were linked to the occupational sectors in which these young adults worked. For example, dropouts were more likely than high school graduates to be employed in low-skill jobs, such as laborers or mechanics. In addition, eighth-grade students exhibiting low mathematics achievement (those who scored in the lowest quartile of the NELS:88 mathematics test) were about three times more likely than high-achieving 1988 eighth-graders (those who scored in the highest quartile) to work as laborers or mechanics 12 years later. Conversely, high mathematics achievers were more likely than low achievers to be working in the following occupational fields in 2000: education; business and management; engineering, architecture, and software; computer science; editing,

[3]The reference here is to a certificate certifying completion of a postsecondary education program, usually requiring less than 2 years of study or enrollment. (For example, one might obtain a certificate in some aspect of computing or data processing.) Not included here are postbaccalaureate or post-master's degree certificates. (For example, a paralegal certificate program might have a B.A. or B.S. degree as a prerequisite for admission.)

[4]In this report, race categories (Black, White, etc.) exclude individuals of Hispanic ethnicity, who are reported separately in their own (Hispanic) category.

writing, reporting, or performance art; and research, science, and technical fields.

Job satisfaction

Eighth-grade cohort members who were employed in 2000 were generally satisfied with most aspects of their jobs. While job satisfaction[5] did not vary widely with cohort members' characteristics, it did vary with educational attainment. Job satisfaction increased as educational attainment increased. Moreover, satisfaction rates for several specific job aspects also generally increased with self-reported educational attainment: opportunities for further training, fringe benefits, job security, and promotion opportunities.

Use of computers on the job

The widespread adoption of computers in the workplace over the last decade or two has influenced work in many ways (Barton 2000; Mare 1995). In 2000, about 66 percent of employed 1988 eighth-grade cohort members reported using computers on the job "a lot." About half of employed cohort members reported using computers frequently in their jobs for e-mail (53 percent) and almost 50 percent for technical, spreadsheet, or data work. Some 46 percent reported using computers frequently for word processing. Women were more likely than men to frequently use computers at work at all, but men were more likely to frequently write software.

Computer use varied according to the worker's level of education. Cohort members with higher self-reported educational attainment were more likely to use a computer on the job for any task and to search the Internet, send e-mail, and use word processing software. Also, 1988 eighth-graders who reported earning a high school diploma by 2000 were about three times more likely than dropouts to frequently use a computer (72 percent vs. 23 percent) in their jobs; diploma earners were about twice as likely as their high school dropout counterparts to use computers frequently for most specific tasks.

Job training

An important measure of job quality is the training and opportunities for skill building that the employer supports. Some 61 percent of the 1988 eighth-grade cohort who were employed for pay in 2000 had received job training in the previous 12 months. Cohort members with more education were more likely to participate in such training. Cohort members who had dropped out of high school were much less likely than those who reported having earned a high school diploma to have received job training in the last year (23 percent vs. 64 percent).

Income; receipt of public aid

The 1999 median income of cohort members working for pay was $24,500. Consistent with research that shows high premiums for college completion in the 1980s and 1990s (Boesel and Fredland 1999, p. ix), income did vary by level of education for the cohort. Indeed, the income premium for having a bachelor's degree over having no postsecondary education was about 33 percent, a notable difference in median income even at this early stage of cohort members' careers.

Welfare payments and other forms of public aid provide support for people living in poverty, particularly for poor families with young children. A total of 3.4 percent of the 1988 eighth-grade cohort received some type of public aid in 1999, with most recipients (2.8 percent of the cohort) receiving food stamps. Cohort members who had earned high school diplomas were much less likely to be aid recipients (2 percent received any aid) than either GED completers or high school dropouts (about 11 percent for each group).

Current Work and Education Activities

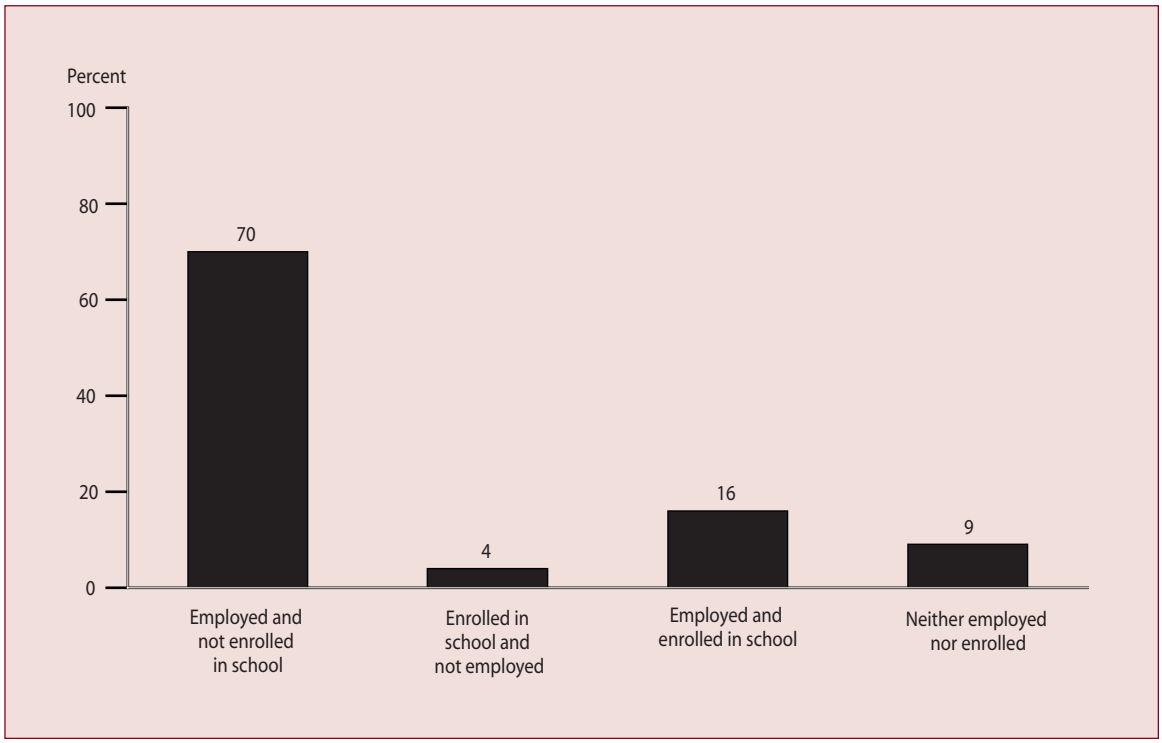
Cohort members were engaged in a range of activities in 2000, notably working and continuing their education. About 70 percent were employed exclusively, another 16 percent were working while going to school, and 4 percent were enrolled exclusively (figure A). Thus, about 86 percent of cohort members were employed and 20 percent were enrolled in some type of postsecondary education. Others were keeping house full time, and some were between jobs.

Among the whole cohort, men were more likely than women to be working (regardless of their school enrollment status) and to be working and not enrolled in postsecondary education. Comparable proportions of both sexes (about 16–17 percent) were simultaneously enrolled and employed, while women were more likely to be engaged in neither activity.

The choices that people make in high school and young adulthood shape, and in some cases limit, the choices they make and options they have later in life. One of the most important decisions is whether to participate in further schooling after completing high school. This report

[5]NELS:88/2000 measured job satisfaction overall as well as satisfaction with fringe benefits, opportunities for further training, job security, opportunities for promotion, opportunities to use past training, importance and challenge of the work, and pay.

Figure A.—Percentage of 1988 eighth-graders involved in various work and schooling activities: 2000



NOTE: Detail may not add to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000), Data Analysis System.

therefore examines the cohort's current activities by their postsecondary education status in 2000.

No postsecondary education

The primary activities occupying 1988 eighth-grade cohort members in 2000 depended to a large extent on their educational attainment. Among the 24 percent of cohort members who had not pursued any postsecondary education, most (82 percent) were employed: 75 percent had full-time jobs and 13 percent had part-time jobs.[6]

Some postsecondary education

Almost half of the 1988 eighth-grade cohort members (46 percent) had some postsecondary education experience but had not earned a bachelor's degree by 2000 (the group includes completers of postsecondary certificates and associate's degrees). Of these cohort members, about 86 percent had jobs in 2000—64 percent were employed exclusively, and another 23 percent were combining work and school.

Whether cohort members started postsecondary schooling immediately after high school or after a delay, approximately the same percentages were working, going to school, or combining the two activities in 2000. Many cohort members with some education beyond high school expected (in 2000) to complete a bachelor's or higher degree by age 30. While many in this group may be on track to achieve their educational ambitions, 60 percent of those who planned to earn a bachelor's degree by age 30, as well as 43 percent of those who expected to complete an advanced degree, were not enrolled in school in 2000, the year that most cohort members turned 26.

Bachelor's or higher degree

Of those members of the cohort who reported that they had finished at least a bachelor's degree (29 percent), 72 percent were employed but not enrolled in 2000, with males more likely than females to be in this category (74 percent vs. 69 percent). Among those with at least a bachelor's degree by 2000, 53 percent planned to earn an advanced degree by the time they were 30 years old. Of those with only a bachelor's degree who expected to earn an advanced degree by age 30, 37 percent were enrolled in a 2- or 4-year academic program.

[6]The percentage of all people employed (82 percent) is lower than the sum of respondents with full-time jobs (75 percent) and the percentage of respondents with part-time jobs (13 percent) because respondents could have both types of jobs simultaneously.

Even among those who did not expect to earn a higher degree in the near term, some (8 percent of bachelor's degree holders and 16 percent of master's degree holders) were continuing their formal education—some studying a subject of interest, learning skills demanded in the labor market, or working on a doctorate or other degree that they did not expect to finish within approximately the next 4 years. The vast majority of those who had met their educational goals for age 30 were exclusively employed in 2000: 88 percent of those with a bachelor's degree and no further educational expectations were working but not enrolled.

All postsecondary education levels

In sum, those cohort members who had completed at least a bachelor's degree and those who had *not* enrolled in postsecondary education at all were the most apt to be working exclusively. Cohort members who had some postsecondary education but no bachelor's degree were more likely than their counterparts with a bachelor's or higher degree to be combining work and study.

Family Formation Activities

Marital status

Overall, 53 percent of 1988 eighth-grade cohort members were single (had never married) in 2000, and another 39 percent were currently married. (Some 5 percent were divorced, 2 percent separated, and about 1 percent living in a marriage-like relationship.) Approximately 60 percent of male cohort members were single, compared with 46 percent of females. Not surprising, then, is the finding that women were more likely to be married in 2000: 45 percent of the women and 34 percent of the men were currently married.

Cohort members from advantaged backgrounds (those having high-SES families, parents with bachelor's or higher degrees, and mothers who expected them to complete college) were in general more likely to be single in their mid-twenties than those who were less advantaged, probably as a result of pursuing postsecondary education at higher rates. Roughly two-thirds of 1988 eighth-grade cohort members with a bachelor's or higher degree were single in 2000 (66 percent of those with a bachelor's degree and 67 percent of those with a master's degree or higher), compared with one-half (52 percent) of those with some postsecondary education (but no bachelor's or higher degree) and 39 percent of those who had not gone to college.

Parental status

With the increase of postsecondary educational aspirations (Green, Dugoni, and Ingels 1995) and attainment (National Center for Education Statistics 2001) in recent years, especially among women, many women have postponed childbearing (Kalb 2001). While 59 percent of the 1988 eighth-grade cohort had no children in 2000, among those who did, 31 percent were not married—41 percent of mothers and 17 percent of fathers were raising their offspring without a spouse. Women were more likely than men to have one or two children and less likely to have no children in 2000.

Whether and how cohort members finished high school was associated with whether they had any children by 2000. While 22 percent of high school dropouts and 34 percent of GED holders had no children, 66 percent of high school graduates had no children in 2000. Moreover, among the parents in the cohort, 48 percent of GED holders, 37 percent of high school dropouts, and 27 percent of high school graduates were single parents.[7] Those who had no risk factors[8] at eighth grade for later dropping out of high school were more likely to be childless than those with one or more risk factors. For example, 68 percent of those with no risk factors were not parents in 2000, compared with 32 percent of those with three or more risk factors.

Civic and Leisure Activities

Among the public goals of education are fostering good citizenship skills and developing civic values and participation. In turn, educational attainment is associated with more active and effective citizenship (Nie, Junn, and Stehlik-Barry 1996). Thus, one benefit of formal education is developing citizens who are more fully integrated and active in their communities.

Among the 1988 eighth-grade cohort as a whole, participating in political campaigns was much less common (4 percent) than volunteer work for youth organizations or civic/community organizations (19 percent and 22 percent, respectively). The likelihood of volunteering for either youth or civic/community organizations increased with the level of postsecondary education attained.

[7] Most of these differences, though they appear large, were not statistically significant.

[8] Again, the risk factors (at eighth grade) used in this report are living in a single-parent household; having neither parent complete high school; having an older sibling who dropped out of high school; being home alone after school for more than 3 hours a day; being limited English proficient; and being in a low-income family (less than $15,000 annual income in 1987).

The NELS:88 interview in 2000 also elicited information about reading habits, home use of computers, and informational uses of the Internet. Members of the eighth-grade cohort who were high school dropouts were less likely than those who graduated from high school to read books at home at least 3 days a week in 2000. Furthermore, the likelihood of, first, using computers at home, and second, searching the Internet for information, increased with cohort members' level of postsecondary attainment.

Further Research

This report examines the status of the 1988 eighth-grade cohort 12 years later, enabling us to see what cohort members had accomplished and done with their lives by 2000. The analyses here touch on the major areas of information collected in 2000. While these analyses describe the current status of the cohort and map some of the paths cohort members have followed, they do not utilize data from the intermediate points in time (data collected in 1990, 1992, and 1994) that would help identify the factors that acted as obstacles or sources of assistance to members of the 1988 eighth-grade class in realizing their goals. This report therefore also presents suggestions for further research using the NELS:88 data, now that information from the 2000 interview has become available.

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Data source: The NCES National Education Longitudinal Study of 1988 (NELS:88).

For technical information, see the complete report:

Ingels, S.J., Curtin, T.R., Kaufman, P., Alt, M.N., and Chen, X. (2002). *Coming of Age in the 1990s: The Eighth-Grade Class of 1988 12 Years Later* (NCES 2002–321).

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To obtain the complete report (NCES 2002–321), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Electronic Catalog (http://nces.ed.gov/pubsearch).

Invited Commentary: Tracing Educational Trajectories Through Longitudinal Studies

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This commentary represents the opinions of the author and does not necessarily reflect the views of the National Center for Education Statistics.

The release of the fourth follow-up to the National Education Longitudinal Study of 1988 (NELS:88) serves as a vivid reminder of the importance of the Longitudinal Studies Program of the National Center for Education Statistics (NCES). Over the past four decades, this series of studies has done more to chart the educational and social trajectories of America's youth than any other federal resource. The Education Longitudinal Study of 2002 (ELS:2002), which surveyed 10th-graders in the spring of 2002, promises to continue this trend, informing researchers, policymakers, and the public about the shifting landscape of the American education system and the implications of this landscape for individual lives and careers.

Coming of Age in the 1990s: The Eighth-Grade Class of 1988 12 Years Later examines the findings of the fourth follow-up to NELS:88. The primary message of this statistical analysis report is that "the rich get richer." There are many varieties of riches, but here I refer specifically to the socioeconomic status of eighth-graders' families and to eighth-grade mathematics achievement. The social advantages enjoyed by some eighth-graders translate into higher rates of high school completion, postsecondary attendance, and educational attainment. In turn, the higher postsecondary attainments of advantaged eighth-graders lead to careers in which computers are used frequently and that offer more job training.

Similarly, those youth with higher mathematics achievement in eighth grade are more likely to complete high school and go on to obtain a bachelor's or higher degree. They too are much more likely to use computers frequently on the job—particularly for technical, spreadsheet, or data work, for word-processing, or to send e-mail—and to receive on-the job training. And by age 25, students who had been in the highest quartile in mathematics achievement in the eighth grade in 1988 were earning 23 percent more per year in 1999 than students who had been in the lowest quartile. Over time this gap may widen, and of course the cumulative gap in earnings rises sharply over the years.

Whether this pattern of cumulating advantages and disadvantages is good public policy is a very complex question, and individuals' judgments about this question often depend on whether they see themselves as advantaged or disadvantaged. In many cases there are competing explanations of how these patterns of academic and social advantage and disadvantage emerge. One of the great strengths of the fourth follow-up to NELS:88 is that it provides a new vantage point for exploring these explanations. Much has happened in the lives of these eighth-graders since they were initially surveyed in 1988, and many of the events that we associate with the transition to adulthood—completing full-time schooling, beginning a regular job, and forming a family—occurred between 1994, the timing of the third follow-up to NELS:88, and 2000, the date of this most recent (and possibly final) snapshot of the accomplishments of this cohort. Our ability to comprehend this transition, and what it says about the process that guides educational and occupational success, would have been severely compromised if our last contact had been in 1994, when many of the youth in this cohort were but 20 years old.

If we are likely to learn so much from studying the young adult years of ages 20 to 26, why stop there? Might we not learn as much from further follow-ups? Long-term follow-ups of the 8th-, 10th- and 12th-grade cohorts surveyed in the NCES Longitudinal Studies Program have always seemed to be afterthoughts—luxuries rather than necessities. I can posit several reasons why this might be so. First, the Longitudinal Studies Program has not had adequate financial or political support nor has it captured the policy interests of other NCES periodic surveys. Second, there always seems to be more public and political interest in *this* year's crop of students than in the ongoing accomplishments of some *older* group of students. Third, in the early years of the Longitudinal Studies Program, there was a consensus that much of the action took place in high school, with the subsequent experiences and accomplishments of youth simply a straightforward extrapolation of the sorting and selecting that took place in the secondary school years.

The design of NELS:88 reflected a growing interest in the middle grades. But the sampling of eighth-graders in the base year of the study produced logistical nightmares, as many more students changed schools between the base year and first follow-up than could have been anticipated on the basis of the National Longitudinal Study of the High School Class of 1972 or the High School and Beyond studies. The return of ELS:2002 to a cohort of 10th-graders reflects the high cost of tracing and resurveying highly mobile students. It is, I trust, a decision driven more by budgetary realities than by a dismissal of the importance of the middle years of K–12 education.

Policymakers remain focused on elementary and secondary schooling. It is at these levels that the United States has what can best be described as a *system* of public (and private) education, and age-graded compulsory schooling laws make clear that the state's commitment to educating the young does not yet extend beyond high school. One would be hard-pressed to characterize postsecondary education as a system, given the tremendous variety of postsecondary institutions and the limited oversight offered by the federal government and the states. There is much more consensus on what all students should learn in elementary and secondary school than there is regarding the curricular content of postsecondary schooling. Consequently, policymakers gravitate toward issues that seem amenable to government intervention, and K–12 schooling seems much more tractable than the jumbled world of higher education. It seems only natural that NCES would respond in kind.

The results from the fourth follow-up to NELS:88 tell a different story, however. They point to an important shift in the careers of America's youth. Three-quarters of the members of the eighth-grade cohort of 1988 had participated in postsecondary education by the year 2000 (roughly by age 26), and nearly one-half of the cohort reported some postsecondary schooling, but no bachelor's degree. Some fraction of these youth are likely en route to a bachelor's degree, but many of them have histories of intermittent, part-time enrollment that may not culminate in any postsecondary credential at all. Nearly two-thirds of the 1988 eighth-graders who participated in postsecondary education transferred credits, and one in nine attended more than one institution at the same time. In the year 2000, 80 percent of those still enrolled in postsecondary education were working for pay at the same time.

What these data suggest is greater complexity in the individual trajectories, or careers, that characterize the movement from adolescence to adulthood. We know rather little about the lives and careers of this emerging group of postsecondary enrollees. They are schooled, but are they skilled? The social and economic drawbacks associated with dropping out of high school are well known, and the advantages of completing a bachelor's degree are equally clear. It is the expanding group in the middle that remains a mystery; some fly under the radar of statistical surveys such as the Baccalaureate and Beyond Longitudinal Study, while those in the Beginning Postsecondary Students Longitudinal Study lack some of the information about prior educational experiences needed to place their postsecondary schooling in appropriate context.

Education has become a recurring activity in the lives of American adults. Data from the Adult Education Survey of the National Household Education Surveys Program show that nearly one-half of all adults participated in some form of adult education in 1999. This represents a substantial increase from 1991, when approximately one in three adults participated in adult education. The rates are particularly high for 25- to 34-year-olds, 60 percent of whom reported participation in adult education. But they are not much lower for 35- to 54-year-olds, of whom roughly 50 percent participated in some form of adult education (Creighton and Hudson 2002).

Understanding the role that schooling now plays in the lives of American adults may require a more expansive view than previous follow-ups in the Longitudinal Studies Program have provided. It is a truism in social research that the timing of the observations of a phenomenon of interest should be synchronized with changes in that phenomenon. Things that change quickly must be observed more frequently; things that do not change over long stretches of time need not be observed so often. Whereas it was once safe to assume that leaving school had a sense of finality about it, nowadays movement in and out of the education system—both formal and informal—occurs frequently, and over long stretches of time. If so many young adults are participating in adult education, our understanding of the antecedents and consequences of such participation might benefit from continuing follow-ups of the NELS:88 cohort and of future cohorts such as the high school sophomores sampled in ELS:2002.

Coming of Age in the 1990s also points to the importance of interinstitutional linkages—the linkages between secondary education and postsecondary education, education and work, and education and the family. These linkages have always been a bit of a blind spot for NCES. The Longitudinal Studies Program has devised a series of studies of *individuals*, not of social institutions. With the exception of the secondary school as a context, most of the available data on institutional contexts for learning and human development stem from respondents' self-reports. Such self-reports are necessarily incomplete representations of complex institutions such as work and family.

We learn from the report, for example, that NELS:88 cohort members who had received no postsecondary education by the year 2000 are substantially less likely than their peers with some postsecondary education or a bachelor's degree to have received job training in the previous 12 months. But we have few tools for explaining this variant of the "rich get richer" story. Do those with less education *choose* to pursue job training less often than those with more education, or do firms systematically cultivate the talents of their more educated employees? Absent heroic efforts to gather independent information on employers (e.g., firm personnel policies) and link the data to the individual NELS:88 respondents, the study design does not allow us to adjudicate between these two possibilities.

Recent theorizing in studies of education and the life course has placed the opportunity structure in the foreground and individual decisionmaking in the background. Considering both individual agency and social structure, however, provides a more complete accounting of coming of age than focusing on one to the exclusion of the other. Longitudinal studies such as NELS:88 have been quite successful at documenting the choices that individuals make; they have been less so at illuminating the structural constraints on choice that are represented in interinstitutional linkages. This can best be remedied by gathering more data on the institutional contexts in which individuals act.

It's easy to sit on the sidelines and take potshots at complex studies; it's a wonder that it doesn't happen more often. But I would not want my suggestions for enhancing the utility of the follow-ups of NELS:88 and the new ELS:2002 study to detract from my overall assessment that these studies are a sound investment in understanding contemporary American life. By illuminating the important role of secondary and postsecondary schooling in creating productive adult members of society, the Longitudinal Studies Program of NCES continues to inform public debate about quality and inequality in American education.

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Invited Commentary: Transitioning to Adulthood in a Turbulent Time

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This commentary represents the opinions of the author and does not necessarily reflect the views of the National Center for Education Statistics.

Coming of Age in the 1990s: The Eighth-Grade Class of 1988 12 Years Later provides a comprehensive snapshot of the educational, socioeconomic, familial, and communal experiences of a cohort of 1988 eighth-graders during a period of great national and international economic transformation. To do so, the authors of the report use base-year data from the National Education Longitudinal Study of 1988 (NELS:88) and data from its fourth follow-up, conducted in 2000. The authors use the base-year data to allocate students to different categories and to describe how students who occupied different categories earlier in their educational careers fared in the transition to adulthood. With the 2000 data, they show the overall proportion of students who have followed different paths, reached particular milestones, and more. In short, this snapshot provides important information that policymakers, researchers, educational practitioners, employers, and others need to know.

Were that all, the volume would be a must-read for key actors in society. Yet, at the same time, the authors, with the assistance of Jeffrey Owings and others at NCES, adroitly place this cohort in the context of the changes that have occurred during the cohort's transition from childhood to adulthood. It is easy to forget just how much has changed in the last quarter century. Throughout the volume, the authors remind the reader of the changing context the cohort encountered as it reached key points of transition. Indeed, figure 1 from the report concisely and effectively conveys the diverse and dramatic changes that have occurred since cohort members were born.

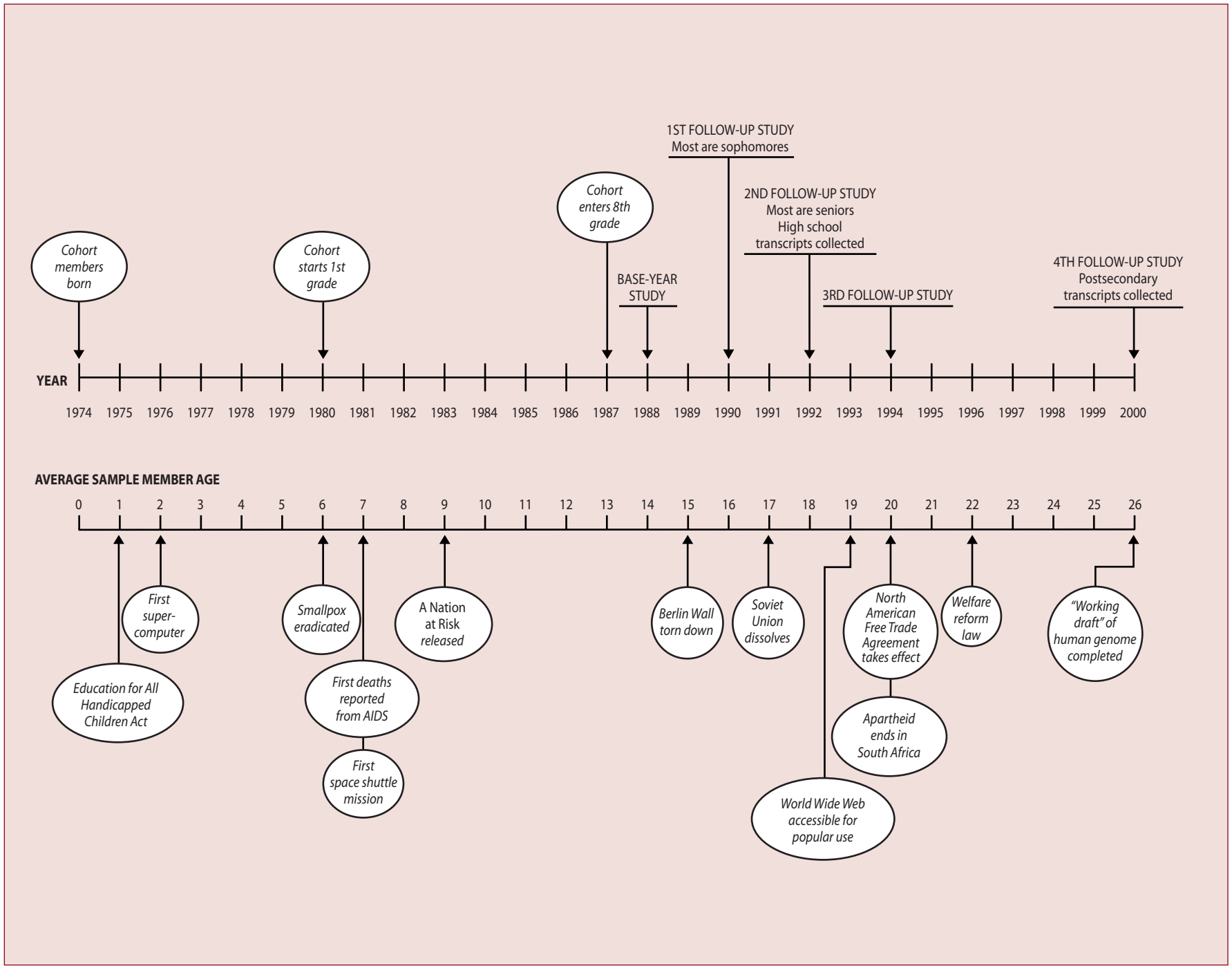
Findings of Change and Stability

Amidst such change we should not be surprised to find changes in cohort members' experiences as well, but the question, of course, is in what ways did their experiences become affected. For example, one of the most far-ranging transformations of the period was the diffusion of computing technology through virtually all sectors of the economy. This diffusion is reflected by the high proportion of cohort members (over two-thirds) who used a computer at work in 2000. Although use of a computer at work varied by socioeconomic background, nearly half of those from the lowest socioeconomic status (SES) quartile, two-thirds of those from the middle-SES quartiles, and nearly four-fifths of those from the highest-SES quartile used a computer at work. Although this socioeconomic gradient is noteworthy, interestingly, some high-level uses (e.g., writing software) showed no differences by socioeconomic background. Hence, by any measure, computers have transformed the workplaces this cohort occupies. The spread of computer technology is just one example of the dramatic changes that have rolled through society since the mid-1970s. *Coming of Age in the 1990s* does an excellent job of keeping the reader aware of how such changes may make a difference.

Amidst such change, however, there are some notable stabilities. Socioeconomic gaps remain substantial in many respects. For example, we learn that nearly 60 percent of students from the highest-SES quartile obtained a bachelor's or higher degree in 2000. In contrast, only 24 percent of students in the middle quartiles obtained a bachelor's or higher degree. Note that these students in the middle quartiles arguably come from middle-class backgrounds. What they are not is the upper middle class, a colloquial term used often in the United States, perhaps to avoid acknowledging that if some are in the middle, then some must be on top. But it is clear that the highest-SES students have markedly better degree attainment prospects than do the middle-SES students. In the same way, the students in the middle-SES quartiles fare far better than those in the lowest-SES quartile; only 7 percent of students from the lowest-SES quartile obtained bachelor's or higher degrees in 2000. In other words, and put crudely, the middle-SES students did about three times better than the lowest-SES students in attaining degrees, and the highest-SES students did about 2.5 times better than the middle-SES students in attaining degrees. In sum, socioeconomic differentials are extremely large.

This is an important set of findings to put before the public, and *Coming of Age in the 1990s* accomplishes that important task. Further research will be needed to ascertain what these socioeconomic-linked differences mean. If these and other socioeconomic differences are large enough, consistent enough, and robust enough, they may support the theory of effectively maintained inequality (EMI) (Lucas 2001). EMI contends that when there are quantitative differences in a good, the socioeconomically advantaged will use their resources to obtain more of the good. An example of a

Figure 1.—Timeline of milestones in NELS:88 study, average age of cohort members, and selected historical events: 1974–2000



SOURCE: Originally published on p. 4 of *Coming of Age in the 1990s: The Eighth-Grade Class of 1988 12 Years Later* (NCES 2002–321).

quantitative difference might be years of schooling; under EMI, we would expect those of advantaged socioeconomic backgrounds to obtain more schooling. And EMI contends that when there are qualitative differences in the good, the socioeconomically advantaged will use their resources to obtain what is qualitatively better. An example of a qualitative difference is provided by tracking: empirical research indicates that students in different educational locations will be exposed to qualitatively different instruction (e.g., Gamoran 1993). We would expect the socioeconomically advantaged to use their resources to obtain the qualitatively better locations, in this case, college preparatory placements in secondary school. Ethnographic evidence is consistent with this expectation (e.g., Useem 1992).

Owing to the ability to trade qualitatively better goods for quantitatively more goods down the road, these processes serve to effectively maintain inequality, perhaps even when access to a good is equalized. Once access to a good is equalized (e.g., access to high school), the socioeconomically advantaged seek out and obtain qualitatively better goods at that level. And those qualitative advantages can be "cashed in" for more of other goods later. In studying the role of socioeconomic background on educational attainment, EMI helped to interpret changes in the effect of socioeconomic background in making several transitions through secondary school on through college entry. This work was done using the High School and Beyond cohort (Lucas 2001). The same kind of process may also be operating in the more recent cohort of 1988 eighth-graders. Whether EMI or some other explanation makes sense of the astounding gross socioeconomic differentials remains for future analysis to discover, but it is clear that the socioeconomic differentials shown in *Coming of Age in the 1990s* cry out for both continuing analysis and, more important, a policy response.

Regrettable Limitations of *Coming of Age in the 1990s*

The foregoing should make clear that *Coming of Age in the 1990s* is an indispensable volume, and nothing below alters that assessment. Yet it is not all that it could be, nor all that the wider public might need it to be, because of several factors. The analysis is very effective at showing how the changing context must be considered in interpreting the attainments of the cohort. In the same way, the youth-to-adult transition has several key moments, which are, in principle, available, due to the longitudinal design of NELS:88. It would have been helpful to see whether a key interim moment, picked up in earlier waves of data collection, played a big role in the attainments observed in 2000. But this might have been very difficult to do, in part because of the very complexity of the NELS:88 data set. Not only were there several waves of data, with some unavoidable attrition owing to the longitudinal design, but earlier waves were subsampled (to contain cost) and freshened, to make the sample nationally representative at different grades. This subsampling and freshening greatly complicates efforts to use more than two waves in any analysis. The complications arise because the set of cases common across more than two waves may not generalize to any easily identifiable population. Perhaps one reason the snapshot contains only two waves of data is that analyzing more than two waves is just too difficult and too complicated, even for those most closely connected to the data collection. If so, it will be important for future data collection to be designed so that future cohorts to be studied will allow analysts to combine the waves so as to sketch the unfolding experiences of the cohorts in a straightforward way.

A second reason *Coming of Age in the 1990s* cannot be all the wider public needs it to be is that a wave of data collection would need to be conducted in 2004 or 2005 to answer many questions posed in the base year. In earlier waves, students and young adults often were asked about their plans and expectations. Students were asked to think about a time far into the future—age 30. For 14-year-olds, such a far-off time—a time further away from them than their own infancy—may be difficult to concretely assess. Yet it was the time frame for which expectations and aspirations were ascertained, and it is a reasonable age to select. The 2000 wave, however, assessed the accomplishments and life-course transitions of young adults at a modal age of 26. If we learn anything from *Coming of Age in the 1990s,* it is that the transitions between ages 14 and 26 were a complex affair for many members of the cohort. The fact that we see that complexity with only two waves of data collection is testimony to the strength of the report. Had the authors analyzed additional intermediate waves, their analysis would only reveal even more complexity.

However, the analytic implication of the complexity is that it is unlikely that one can ascertain whether members of the cohort met the aspirations they set for themselves when in middle school by considering their achievements 4 years before the "deadline" for the realization of those aspirations. Instead, another wave of data collection, measuring accomplishments and attitudes at a modal age of 30, is essential. Absent such a data collection effort, *Coming of Age in*

the 1990s will be our last look at this pivotal cohort. Unfortunately, with that last look, many of the questions that motivated the original investment will remain unanswered. That is not the fault of the authors of the report, but it remains a regrettable circumstance nevertheless.

Concluding Remarks

Coming of Age in the 1990s is an essential volume. It draws on data akin to the Census Bureau's decadal effort to provide a snapshot of the geographic, familial, and socioeconomic location of the nation's inhabitants, with the added complication of connecting observed respondents to "prior" locations. The report is on a par with *State of the Union: America in the 1990s*—a two-volume analysis of 1990 Census data, a work prepared by more than a dozen analysts across the country—in its scope and depth (Farley 1995). *Coming of Age in the 1990s* is an illuminating effort—a success. Clearly, before proposing any policy or engaging in any analysis, it will be necessary to check this report to determine what the general tendency has been; whether that tendency varies by important factors such as prior achievement, geographic location, or socioeconomic status; and to locate the experience of youth in the dramatically changing national and international context.

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