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Early Childhood Longitudinal Study, Birth Cohort (ECLS-B)

Methodology Report for the 9-Month Data Collection (2001–02)

Volume 2: Sampling

June 2005

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1. INTRODUCTION

This report is Volume 2 of the methodology report that provides information about the development, design, and conduct of the 9-month data collection of the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B). This volume begins with a brief overview of the ECLS-B, but focuses on the sample design, calculation of response rates, development of various sets of weights, and nonresponse bias analyses. In addition to this volume, there is a psychometric report (*Early Childhood Longitudinal Study, Birth Cohort* (*ECLS-B), Methodology Report for the Nine-Month Data Collection, 2001–02, Volume 1: Psychometric Characteristics*, NCES 2005–100 (Andreassen and Fletcher forthcoming), which is briefly described in section 1.3. Together these two volumes provide methodological information beyond what is contained in the user's manuals for users who want to obtain additional information about the ECLS-B. Users who are primarily interested in analyzing the data should begin with the user's manuals as they provide an overview of the ECLS-B data collection and contain all the information that users need to begin using the data set.

1.1 Overview of the ECLS-B

The ECLS-B is a multisource multimethod study focusing on the home and educational experiences of children during their first 6 years. The central goal of the ECLS–B is to provide a comprehensive and reliable set of data that may be used to describe and to better understand children's early development; their health care, nutrition, and physical well-being; their preparation for school; key transitions during the early childhood years; their experiences in early care and education programs, kindergarten, and first grade; and how their early experiences relate to their later development, learning, and experiences in school. To achieve this goal, the study is following a nationally representative cohort of children born in 2001 from birth through first grade. The parents of 10,688 children born in 2001 participated in the first wave of the study when the children were approximately 9 months old. Child assessments were conducted on a total of 10,221 of these children.

The study is sponsored by the U.S. Department of Education, National Center for Education Statistics (NCES), in collaboration with several federal education and health policy agencies. Westat, a statistical research organization, conducted the first two waves of the study for NCES.

The ECLS-B is part of the Early Childhood Longitudinal Study (ECLS), a longitudinal studies program comprising two cohorts—a birth cohort (ECLS-B) and a kindergarten cohort (ECLS-K). Together, these cohorts provide the breadth and depth of data required to more fully describe children's health, early learning, development, and education experiences. See http://www.nces.ed.gov/ecls for information about the ECLS program.

1.2 Data Collection Instruments

The ECLS-B 9-month data collection took place from the fall of 2001 through the fall of 2002 (when children born in January through December 2001 turned 9 months of age). Data were collected by computer-assisted personal interviews (CAPI) with parents, self-administered questionnaires, father questionnaires,[1] and direct child assessments during an in-person home visit. Data were also obtained from children's birth certificates and via field staff observation of the children's behavior and home setting during the home visit. Exhibit 1 lists all the sources of data in the 9-month data collection.

Exhibit 1. Sources of data and instruments in the ECLS-B 9-month data collection: 2001–02

9-month data sources and instruments
Direct child assessments
Parent CAPI instrument
Parent self-administered questionnaire
Resident father questionnaire
Nonresident father questionnaire
Child observations and interviewer remarks
Birth certificate

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

[1] If the resident father was not present during the home visit, the father questionnaire was left with the respondent to give to the father to complete. If the father was present, the interviewer gave the questionnaire directly to him. Interviewers sought the mothers' permission to contact the nonresident father for an interview. If the nonresident father was present, permission still had to be obtained from the mothers before giving the nonresident father questionnaire to him.

The ECLS-B nine-month direct child assessments consisted of three components: the Bayley Short Form–Research Edition (BSF-R), the Nursing Child Assessment Teaching Scale (NCATS), and physical measurements. Each of these components is discussed in the nine-month user's manuals, as well as in the psychometric report. Exhibit 2 displays the major domains measured during the direct child assessments by each component. Interviewers administered the components using a hard-copy booklet called the Child Activity Booklet. BSF-R item scores and physical measurements were recorded in the Child Activity Booklet. The instructions and activity list for the NCATS were also included in the Child Activity Booklet, which was available in both English and Spanish.

Exhibit 2. Components and substantive domains covered in the ECLS-B 9-month direct child assessments: 2001–02

Direct child assessment component	Domain coverage
Bayley Short Form–Research Edition (BSF-R)	Cognitive (mental), physical (motor)
Nursing Child Assessment Teaching Scale (NCATS)	Social, emotional, cognitive
Physical measurements (height, weight, middle upper arm circumference, head circumference[1])	Physical

[1] Head circumference was measured only for ECLS-B sampled children who were very low birth weight.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

For details on the content of the different survey instruments and for general information about the direct child assessments, see *Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), User's Manual for the ECLS-B Nine-Month Restricted-Use Data File and Electronic Code Book,* NCES 2004–092 (Nord et al. 2004) or *Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), User's Manual for the ECLS-B Nine-Month Public-Use Data File and Electronic Code Book,* NCES 2005–013 (Nord et al. 2005). To learn about the development of the direct child assessments and their psychometric properties, see *ECLS-B Methodology Report for the Nine-Month Data Collection, 2001–02, Volume 1: Psychometric Characteristics*, NCES 2005–100 (Andreassen and Fletcher forthcoming).

1.3 Documentation and Methodological Reports

Several documents are available to help users familiarize themselves with the ECLS-B. Users should begin with the user's manuals as these contain information about all aspects of the study and should be sufficient for most purposes. For those who desire more information about a particular element of the study, there is the current report on sampling, response rates, weighting, nonresponse bias analysis, and comparison of estimates, as well as a psychometric report.

- **User's Manuals**. Typically, NCES releases both a restricted-use and a public-use data file for each data set it produces.[2] Thus, there are two user's manuals available for the 9-month data collection. The user's manuals are very similar. They describe the background of the ECLS-B study; provide an overview of the data collection instruments and their content; provide information about the sample design and weighting procedures; describe the data collection methods, response rates, data processing procedures, the structure of the data file, and the creation of composite or derived variables; and explain how to use the Electronic Code Book. As noted above, the user's manuals should be the starting point for anyone interested in using the ECLS-B data. See the *User's Manual for the ECLS-B Nine-Month Restricted-Use Data File and Electronic Code Book* (NCES 2004–092) and the *User's Manual for the ECLS-B Nine-Month Public-Use Data File and Electronic Code Book* (NCES 2005–013).

- **Psychometric Report**. The psychometric report documents the design, construction, implementation, quality control, and psychometric characteristics of the child assessment measurements included in the ECLS-B. The report provides an in-depth description of the development of the Bayley Short Form–Research Edition, an innovative feature of the ECLS-B. The psychometric report will be useful to users who are interested in using the direct child assessments in their analyses and want to obtain a better understanding of how they were developed and their psychometric properties. See *ECLS-B Methodology Report for the Nine-Month Data Collection, 2001–02, Volume 1: Psychometric Characteristics* (NCES 2005–100).

1.4 Contents of This Report

This report provides information about the sample design, response rates, development of four different sets of weights for different forms of analyses, and nonresponse bias analyses for the ECLS-B 9-month data collection. Chapter 2 describes the ECLS-B sample design. Chapter 3 presents the

[2] The restricted-use files generally contain a few more variables than the public-use files because they are not subject to the same level of disclosure risk protection as the public-use files. However, as a safeguard to respondents, users wishing to obtain access to the restricted-use files must enter into a formal agreement with NCES that includes signing an affidavit stating that they will abide by NCES' standards of confidentiality or be subject to penalties.

response rates for the 9-month round. Chapter 4 describes the development of different sets of weights. Chapter 5 presents the results of the 9-month nonresponse bias analysis. Chapter 6 provides comparisons of ECLS-B data with the data of other surveys. An appendix to this report gives standard errors and design effects for selected variables from the 9-month data collection.

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2. SAMPLE DESIGN

2.1 Background

The Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) selected a nationally representative probability sample of children born in 2001. Births were sampled within a set of primary sampling units (PSUs) and in some cases secondary sampling units (SSUs) in order to control data collection costs.[1] Children were mostly sampled via registered births from the National Center for Health Statistics (NCHS) vital statistics system (Hetzel 1997).[2] This clustered list-frame design allowed for maximum, efficient coverage of the target population and was considered preferable to other approaches that would involve large screening efforts or coverage errors (e.g., sampling hospitals and other birthing places, augmenting household surveys, or sampling birth certificates available at a variety of levels: NCHS, state registrars, and county and local records offices).[3]

The ECLS-B target population consists of all children born in the United States in the year 2001 with the following exceptions:

- Children born to mothers less than 15 years of age (less than 0.2 percent);[4]
- Children who died before the 9-month assessment (less than 0.7 percent);[5] and
- Children who were adopted prior to the 9-month assessment (unknown, see section 2.7.2).

Children born to mothers less than 15 years of age were excluded from the sampling frame in response to state confidentiality and sensitivity concerns. Sampled children whom the states identified as having died or having been adopted prior to the 9-month assessment were removed from the study in field operations.

Over 14,000 births were sampled and fielded and yielded 10,688 9-month cases with at least a completed interview with the child's parent (see section 3.1.1 for a discussion of 9-month components). The sample size was designed to produce survey estimates with specified precision targets both overall and for specific domains (see section 2.4). More details on the ECLS-B analytic domains, the PSU sample design, consent processes and restrictions, substitution and alternative frames, and the sampling of birth

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[1] A PSU is an individual county or group of contiguous counties. An SSU is a county or group of contiguous counties within a multi-county PSU.
[2] In two PSUs, births were selected from lists provided by hospitals.
[3] See Levine and Bryant (1997).
[4] *National Vital Statistics Reports*, Volume 51 (2), Centers for Disease Control and Prevention, National Center for Health Statistics, 2002.
[5] *National Vital Statistics Reports*, Volume 52 (2), Centers for Disease Control and Prevention, National Center for Health Statistics, 2003.

certificates within PSUs/SSUs can be found in chapter 4 of the *Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) User's Manual for the ECLS-B Nine-Month Public-Use Data File and Electronic Code Book,* NCES 2005–013 (Nord et al. 2005). The remaining sections of this chapter supplement chapter 4 of that manual, for brevity referred to henceforth in this report as the *Nine-Month User's Manual*, providing additional detail on the sample design. Section 2.2 provides additional details on the ECLS-B PSU sample design and stratification. Section 2.3 presents information on PSU/SSU substitution and the use of alternative frames. Section 2.4 presents the original precision objectives and sample sizes for the study. Section 2.5 documents the sample reduction implemented in March of 2002 to control data collection costs. Section 2.6 presents the expected and actual nine-month yields. Section 2.7 evaluates the sample design assumptions. Section 2.8 documents the calculation of selection probabilities and base weights, the former being complicated for American Indian or Alaska Native (hereafter called American Indian or AI) births because of the use of a dual frame design involving the core PSU sample and an American Indian supplemental PSU sample. All of these sections provide detail beyond that in chapter 4 of the *Nine-Month User's Manual*, which should be read prior to or in conjunction with this material.

2.2 Primary Sampling Unit and Secondary Sampling Unit Sample Design

The ECLS-B analytic domains included domains defined by race/ethnicity (American Indian, Chinese, Other Asian or Pacific Islander, Hispanic, Black, non-Hispanic, White, non-Hispanic). The sample sizes needed for most of these domains could be accommodated in a general purpose PSU design. However, since a sizable proportion of the American Indian domain is concentrated in a few areas, this domain required special procedures. An American Indian supplemental PSU sample was therefore added to the core PSU design to provide the required representation of this subpopulation.

2.2.1 Core Primary Sampling Unit Sample Design

Contiguous counties were combined to form PSUs for the ECLS-B. Metropolitan statistical area (MSA) definitions were used in large metropolitan areas and the NCHS health service areas[6] (U.S. Department of Health and Human Services, National Center for Health Statistics 1991) were used in other areas as a guide for combining counties to form PSUs. Health service areas are relatively self-contained in terms of health service supply and demand; they were especially useful in forming PSUs in rural areas,

[6] The National Center for Health Statistics health service areas were created for the National Health Interview Survey.

where it was often necessary to combine several counties because of the relatively low incidence of births. In constructing PSUs of adequate size, counts of births were averaged over the years 1994, 1995, and 1996 to obtain annualized estimates for each county.

As discussed in section 4.1.1 of the *Nine-Month User's Manual*, a set of analysis domains were defined based on race/ethnicity (American Indian, Chinese, Other Asian/Pacific Islander, Hispanic, Black non-Hispanic, and White non-Hispanic); birth weight (very low, moderately low, and normal); and plurality (twins versus other births). These domains were cross-classified to define a set of 36 mutually exclusive subgroups, termed case strata in what follows.

A composite measure of size (MOS) that utilized the analysis domains was computed for each PSU using the formula given in Folsom, Potter, and Williams (1987). First, let

N_k = average number of births in 1994-1996 in the k-th case stratum;
n_k = required sample size for the k-th case stratum; and
f_k = n_k / N_k.

Let M_{ik} denote the number of births in the k-th case stratum within the i-th PSU. The adjusted MOS for the i-th PSU is computed as

$$M_i = \sum_k f_k M_{ik} .$$

Thus, the measure of size is computed as a weighted sum over the case strata, with the weight for a given case stratum being computed as the required sample size divided by the overall population size for that case stratum. The objective of weighting the MOS was to obtain approximately equal workloads within PSUs to meet the sample size requirements discussed in section 2.4 of this report. Since sponsorship for both the Chinese and American Indian race/ethnicity subgroups as ECLS-B analytic domains was received subsequent to PSU sample selection, the MOS described above was calculated over 24 case strata rather than 36 case strata.

Before selection, the PSUs were stratified by region, median household income, proportion minority population, and metro versus non-metro area. Wherever possible, PSUs were stratified by high/low income and minority status; where this was not possible, strata were formed using a mixture of PSUs. Minority status was a dichotomous classification based on the percent Black and Hispanic population within a given region and income. Metro status was determined by county based on the

Census Bureau's 1999 MSA definitions. Table 1 shows the stratification, measures of size, and counts of PSUs for the core ECLS-B sampling frame. Twenty-four of the PSUs were so large that each became a certainty selection and thus its own stratum. Each of the other strata had a sample of two PSUs selected from it.

In general, the selection probability for the ith PSU in stratum h is given by

$$p_{hi} = \frac{2M_{hi}}{\sum_{i=1}^{N_h} M_{hi}}$$

where N_h is the number of PSUs in stratum h. As noted above, oversized PSUs with very large MOS (M_{hi}), were selected with certainty and are called certainty PSUs.

Two PSUs were selected from each stratum with probability proportional to size (PPS) using Durbin's "Method I" (see Brewer and Hanif 1983, p. 27). Let $2p_i$ be the required selection probability for the i-th PSU. Durbin's method then consists of the following steps:

1. Select the first PSU with probability p_i.

2. With no loss of generality, assume that the selected PSU is i = 1. Select the second PSU, j, with probability proportionate to

$$p_j\left(\frac{1}{1-2p_1}+\frac{1}{1-2p_j}\right).$$

This algorithm gives each PSU a selection probability of $\pi_i = 2p_i$ with joint inclusion probabilities of

$$\pi_{ij} = \frac{2p_i p_j\left(\frac{1}{1-2p_i}+\frac{1}{1-2p_j}\right)}{\sum_{k=1}^{N}\frac{p_k}{1-2p_k}}.$$

Table 1. Core ECLS-B primary sampling unit sampling frame stratification, 9-month data collection: 2001–02

Stratum	Region	Income	Minority	Metropolitan status	MOS[1]	PSUs[2]	Selected
Certainty					4,568.3	24	24
Overall noncertainty					9,019.7	480	72
01	1	Mixed[3]	Low	Mixed	259.8	25	2
02	1	Low[3]	Mixed	Mixed	247.0	8	2
03	1	Mixed	Mixed	Mixed	246.5	9	2
04	1	Mixed	High	Mixed	260.4	6	2
05	1	High[3]	High	Mixed	300.8	4	2
07	2	Mixed	Mixed	Non-metropolitan	257.8	40	2
08	2	Low	Low	Metropolitan	245.0	22	2
09	2	Mixed	Mixed	Metropolitan	241.5	20	2
10	2	Mixed	High	Metropolitan	246.3	9	2
11	2	High	High	Metropolitan	249.3	10	2
12	2	Mixed	High	Metropolitan	256.9	7	2
13	2	High	High	Metropolitan	237.9	4	2
14	2	Mixed	High	Metropolitan	251.2	5	2
15	2	High	High	Metropolitan	249.0	3	2
16	3	Mixed	Mixed	Non-metropolitan	237.9	37	2
17	3	Mixed	High	Non-metropolitan	244.9	32	2
18	3	Low	Low	Metropolitan	265.2	14	2
19	3	Mixed	Low	Metropolitan	272.0	11	2
20	3	Mixed	Low	Metropolitan	254.6	10	2
21	3	High	Low	Metropolitan	256.6	9	2
22	3	Mixed	Low	Metropolitan	244.7	11	2
23	3	High	Low	Metropolitan	261.3	7	2
24	3	Mixed	High	Metropolitan	259.3	14	2
25	3	High	High	Metropolitan	274.0	7	2
26	3	Mixed	Mixed	Metropolitan	328.5	8	2
28	3	Mixed	High	Metropolitan	224.8	10	2
29	3	High	High	Metropolitan	232.7	4	2
30	3	Mixed	High	Metropolitan	244.3	15	2
31	3	High	High	Metropolitan	267.2	6	2
32	4	Mixed	Mixed	Non-metropolitan	184.4	31	2
33	4	Low	Mixed	Metropolitan	233.3	18	2
34	4	Mixed	Mixed	Metropolitan	226.0	13	2
35	4	Mixed	High	Metropolitan	217.2	6	2
36	4	High	High	Metropolitan	301.9	8	2
37	4	Mixed	High	Metropolitan	205.5	5	2
38	4	High	High	Metropolitan	234.1	4	2

[1] Measure of size.
[2] Primary sampling unit.
[3] “Low” and “high” are relative within region. “Mixed” indicates no “low” and “high” split on the given dimension.
NOTE: Two strata (06 and 27) were collapsed and do not appear in this table.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

In some cases, PSUs were subdivided into SSUs, which also consisted of contiguous counties. As described in the next section, a sample of SSUs was drawn within PSUs in order to decrease travel-related costs.

2.2.2 Division of Primary Sampling Units Into Secondary Sampling Units

After the core PSUs had been selected, it was decided, based on the pilot study experience, that the sample of births in some large PSUs would be too widespread for economic data collection. Some large PSUs (original or substitute) were therefore subdivided into SSUs, and a sample of SSUs was selected, in order to increase the clustering of sampled births and decrease between-interview travel costs. The SSUs were mostly single counties but sometimes groups of counties. When this subdivision was feasible, one or more SSUs were selected with probability proportional to expected births by residence. This measure of size differs from the measure of size for selecting PSUs, which was the expected number that *occurred* in the PSU. The reason for this change was that it was decided to sample births in the SSUs from the births to mothers who resided in those SSUs—rather than from births occurring in those SSUs, in contrast to what was done elsewhere—in order to minimize interviewer travel. To avoid undercoverage, any births to mothers who resided outside the PSU were assigned to the SSU where the birth occurred.

In all, 44 of the 96 ECLS-B core PSUs were subdivided into a total of 149 SSUs, from which 53 were selected. However, the subdivision and selection of SSUs did not affect all analytic domains. Data collection for the two rarest domains (Chinese and very low birth weight) was still distributed across the entire PSU.

With regard to subsampling SSUs within certainty PSUs, it should be noted that the original certainty PSUs are strata, and the units sampled within them are in fact the PSUs. In sampling PSUs within each of two such certainty selections, one PSU remained a certainty selection and two other PSUs were selected from the remaining PSUs by controlled selection. Controlled selection was used in these cases to select a pair of PSUs that provided a good representation in terms of median income and the percent minority population. This technique maintains the correct selection probabilities for all PSUs. However, any gains in precision resulting from the use of controlled selection in these two cases cannot be reflected in the variance estimates. The procedure used for ECLS-B variance estimation treats the two PSUs as independent selections from their stratum, and this procedure likely results in a slight overestimate of the true variances. However, since controlled selection was used with only two pairs of PSUs, the extent of overestimation will be negligible, given the small proportion of the sample involved.

2.2.3 American Indian Supplemental Primary Sampling Unit Sample Design

The core PSU sample had already been selected when the decision was made to include an American Indian (AI) domain in the survey. The core PSU sample could not provide an effective American Indian sample of the required size because the proportion of American Indian births in most areas is quite small and, furthermore, many American Indian births are concentrated in a few, sparsely populated areas. Because of these difficulties, a supplemental American Indian PSU frame was developed and a supplemental American Indian sample was selected.

The general specifications for the American Indian supplement sample were as follows:

- An initial sample size of approximately 1,250 American Indian births;
- A within-PSU selected sample size of at least 50 American Indian births to provide for an efficient workload; and
- At most 20 PSUs to be sampled.

The American Indian PSU frame was constructed to consist of counties or groups of contiguous counties that had at least an expected 50 American Indian sampled births based on 1994-1996 NCHS natality detail files and that had relatively large proportions of American Indian births. The frame contained 108 PSUs, most of which were individual counties. Eighteen PSUs were selected for the supplement sample from this frame, six of which were certainty selections. Table 2 describes the American Indian PSU frame and its stratification by geographic region, with finer breakdowns by state within some regions.

Table 2. American Indian primary sampling unit sampling frame, 9-month data collection: 2001–02

Stratum description	Estimated American Indian/Alaska Native births		Count of primary sampling units	
	Count	Percent	Frame	Sample
Certainty strata[1]	6,339	100.0	6	6
Noncertainty strata	18,607	100.0	108	12
1 Eastern[2]	2,922	15.7	17	2
2 Midwest, lower[3]	3,144	16.9	20	2
3 Midwest, upper[4]	3,134	16.8	18	2
4 Oklahoma	3,160	17.0	12	2
5 Western, upper[5]	3,228	17.3	23	2
6 Western, lower[6]	3,019	16.2	18	2

[1] Includes Alaska, Hawaii.
[2] Eastern states are Alabama, Connecticut, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, Wisconsin.
[3] Midwest lower states are Arkansas, Colorado, Iowa, Kansas, Louisiana, Missouri, Nebraska, New Mexico, Texas.
[4] Midwest upper states are Minnesota, North Dakota, South Dakota.
[5] Western upper states are Idaho, Montana, Oregon, Washington, Wyoming.
[6] Western lower states are Arizona, California, Nevada, Utah.
NOTE: Detail may not sum to totals due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

The 12 noncertainty PSUs were selected independently of the core sample PSUs, with probability proportional to the estimated number of American Indian births with each stratum. One of these PSUs included the Navajo Nation reservation, whose institutional review board did not approve participation in the study. Sampled cases that were contained within the reservation boundaries in this PSU were treated as nonresponse. This loss of sample size was taken into account when adjusting rates for the overall sample reduction (see section 2.5).

The full American Indian sample consists of American Indian cases selected within

- The 18 PSUs selected from the American Indian PSU frame; and
- The 92 PSUs selected for the core ECLS-B PSU sample.

This combination provides full coverage of the American Indian population. Note that American Indian births in counties covered by the American Indian PSU frame have two ways of being selected for the ECLS-B: from the supplement sample and from the core sample. This feature is reflected in the weighting as discussed in section 2.8.

2.2.4 Overlap Between the Core and American Indian Samples

Since the ECLS-B core PSU sampling frame covers all U.S. counties, the core sampling frame and the American Indian PSU frame overlap. The core PSUs are often made up of several counties, and particularly so in rural areas, and the American Indian PSUs are mostly single counties; as a result, a core PSU may contain one or more American Indian PSUs. Table 3 shows the extent of the overlap of the sampled core PSUs with the American Indian PSU frame and with the American Indian sampled PSUs. Of 96 sampled core PSUs, 11 overlap with the American Indian PSU frame. None of the overlapping PSUs is a certainty selection in the core sample. Only one sampled core PSU overlaps with the American Indian PSU sample, and that core PSU overlaps with two sampled American Indian PSUs. In that core PSU, the subsampling rates for sampling birth certificates from the two frames were combined (see section 2.8.2.3 for details.)

Table 3. Overlap between core and American Indian frame and sample, 9-month data collection: 2001–02

	Core primary sampling unit (PSU) sample		
	Total	Certainty	Noncertainty
Total	96	24	72
No overlap with American Indian PSU frame	85	24	61
Overlap with frame but not sample	10	0	10
Overlap with American Indian sample	1	0	1

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

2.3 Substitution and Alternative Frames

2.3.1 Consent Processes and Restrictions

The sample design called for the use of the birth certificate records received through the NCHS vital statistics system as the sampling frame to be used for selecting births within selected PSUs. Since these records are the property of the states, the first step in study enrollment was to obtain permission from state registrars in states with sampled PSUs to use their birth certificate records for sampling purposes. Birth certificates contain information about the child, the mother and the father, including the mother's address. This information was used both to stratify the birth certificates for sampling and to contact mothers of sampled infants. In several states, obtaining permission for access to birth certificates required approval from the state's institutional review board. In addition, some state institutional review boards or registrar offices had requirements that placed restrictions on contacting parents based on birth certificate information. In some cases, these restrictions would have resulted in low response rates or even complete nonparticipation.

The ECLS-B core and American Indian supplemental PSU samples included births occurring in counties within 46 states and in Washington, DC. Ten of the 46 states had state institutional review board or registrar office requirements that put restrictions on the standard ECLS-B contact and consent protocol. The types of restrictions were as follows:

- **Passive consent.** In states requiring passive consent, the state registrar would send a letter to the sampled parents informing them about the study. If the parents did *not* respond, then they were assumed to have given consent for Westat to contact them for enrollment into the study.

- **Active consent.** In states requiring active consent, either Westat or the state registrar would send a letter to parents informing them about the study. However, in this case, parents *must* respond, giving consent to contact them. If they do not respond to the letter, they are considered to have not given consent.

- **Active consent states with PRAMS.** Some states required active consent to participate in the Pregnancy Risk Assessment Monitoring System (PRAMS). In these states, there was already a program in place where local officials contacted mothers to get consent for participation in PRAMS and there was initially a plan to obtain consent for ECLS-B through this program. However, Illinois was the only state in the ECLS-B with this type of restriction and, as discussed below, data collection was done in Illinois through the U.S. Census Bureau.

- **Consent specified on birth certificate.** In one state, parents filled out the following item on the birth certificate: "Parent(s) authorization to receive infant health care information: Yes or No." Although this item did not refer specifically to research studies, the state used the response to this question as an indicator of the parent's willingness to be contacted subsequent to the birth. That is, the registrar released contact information for the parent only if the parent responded affirmatively to the question.

- **No follow-back.** In some cases, state law prohibited the use of birth certificate information to contact parents for "follow-back" research studies like the ECLS-B. Birth certificates could not be used as the sampling frame in these states. While birth certificates could be sampled, information from them could not be used to contact the families of infants who had been sampled.

In states that required active consent or that prohibited follow-back research studies, substitution and alternative frames were used (see discussion below). In Illinois, state law allowed the

Census Bureau to conduct the interviews via an interagency agreement with NCES. In the case of passive consent, larger sample sizes were selected to offset the additional nonresponse that was expected because of enrollment restrictions.

In the 36 states (and Washington, DC) that did not impose restrictions, the standard ECLS-B contact and consent protocol were used. See section 5.3.2 of the *Nine-Month User's Manual* for a description of these procedures.

2.3.2 Substitution and Alternative Frames

In total there were eleven PSUs for which the birth certificate records could not be used as the sampling frame, eight in the core sample and three in the American Indian sample. In two of the American Indian PSUs with enrollment restrictions, an alternative sampling frame was used to draw a sample of births. Specifically, birth records were selected directly from hospital lists of births in counties that defined the original PSUs.

In the remaining eight core and one American Indian PSUs, substitution was done after sampling SSUs, such that substitute PSUs or SSUs in states without enrollment restrictions were selected to replace the sampled PSUs or SSUs. The substitute PSU/SSU "replaced" the original PSU/SSU in the sample, meaning that a sample of birth certificates that matched the sample planned for the original PSU/SSU with respect to sample size and demographic composition was selected in the substitute PSU/SSU.

Wherever possible, in the core sample a substitute PSU/SSU was selected from the same sampling stratum as the originally selected non-certainty PSU/SSU. Substitute PSU/SSUs for the core sample were matched on the following characteristics:

- Median household income (income in table 1);
- Percent minority population (minority in table 1);
- Percent of population in poverty;
- Birth rate;

- Population density; and
- Census region (region in table 1).

Matching was based primarily on a Mahalanobis distance function (Mahalanobis 1975). In addition, individual differences in the values of the variables shown above for the potential substitute PSU/SSU and the original PSU/SSU were considered in choosing substitute PSU/SSUs. Also, the geographic profile of each potential substitute was compared with that of the original PSU/SSU in order to ensure that the selected substitute was a reasonable match for the original PSU/SSU not only demographically, but geographically as well.

In the supplemental sample for American Indian births, substitute PSUs/SSUs were matched on the number of American Indian births, percentage of mothers with high school education, percentage in which both parents were American Indian, and mean birth weight. In addition, candidate substitute PSUs/SSUs were reviewed by an in-house Westat expert on American Indians, who provided information about the social structure, culture, and geographic surroundings of American Indians living in the different regions in the United States. Selection of the substitute PSUs/SSUs was made taking the latter considerations into account. For example, PSUs/SSUs with no associated tribal lands and a limited tribal structure were not substituted for PSUs/SSUs located in reservation areas with a strong tribal structure.

Within the substitute PSU/SSU (core or American Indian supplemental), sampling rates that would deliver the same yield as expected within the original PSU/SSU by case stratum (e.g., Hispanic, normal birth weight, or twin; see chapter 4 of the *Nine-Month User's Manual* for more details) were used.

2.4 Original Precision Objectives and Sample Sizes

2.4.1 Background

The ECLS-B was designed to be large enough to provide estimates of adequate precision for the nation as a whole and for various subgroups, including both the planned analytic subgroups described above and other subgroups (e.g., children living in rural areas, children in single parent families). Moreover, the sample needed to be large enough to allow for the attrition losses that would occur as the panel ages. This section presents the derivation of the initial ECLS-B sample sizes.

The initial design addressed only the race/ethnicity subgroups. It specified a sample of 1,524 completed 9-month interviews for Hispanics, for Black, non-Hispanics, and for Asian/Pacific Islanders, and 4,572 completed 9-month interviews for White, non-Hispanics. The sample size for the last of these groups was made three times larger than the rest because that group comprises the majority of all births. By selecting a sample of this size for White, non-Hispanics, the sampling fractions for this group, Hispanics, and Black, non-Hispanics are fairly similar; it is only the small Asian/Pacific Islander subgroup that required some degree of oversampling. Thus, this sample allocation led to the need for little variation in the sampling weights, a feature that is beneficial for analyses that cut across the race/ethnicity classifications. Based on the assumed response rates discussed below, after attrition, the resultant sample sizes at the sixth round data collection[7] were expected to be 1,248 for the Hispanic, Black, non-Hispanic, and Asian/Pacific Islander subgroups; and 3,744 for the White, non-Hispanic subgroup.

Subsequently, supplementary funds were obtained to include additional subgroups of analytic interest. The overall sample size was increased to raise the sample sizes of very low birth weight infants, moderately low birth weight infants, and twins to a level that made the precision of estimates for these subgroups equal to that for the race/ethnicity subgroups. Because the various analytic subgroups overlap with one another, an increase, for example in the sample of low birth weight infants, will also increase the sample of twins and of the various race/ethnicity subgroups. There are two consequences of this overlap. First, the overlap must be taken into account in determining the minimum overall sample size needed to satisfy all the precision requirements. The mathematical programming approach for solving this problem is discussed in section 2.4.5. Second, there would inevitably be variation in the selection probabilities, and hence in the sampling weights, for the sampled children within each subgroup. Thus, for example, in the Hispanic subgroup, low birth weight twins, non-low birth weight twins, low birth weight non-twins, and non-low birth weight non-twins have different selection probabilities. As a result, the sample size in a subgroup does not serve as a valid index for the level of precision that will be obtained for subgroup estimates. The loss of precision associated with the variation in weights within a subgroup must be taken into account. This was done by computing the *effective sample size* that reduced the actual sample size to compensate for variable weights (Kish 1992).[8] Section 2.4.6 presents the actual sample sizes needed in the various subgroups to yield an effective sample size of 1,524 completed 9-month interviews for each subgroup (other than the White, non-Hispanic subgroup, which had a target effective sample size of 4,572). The effective sample size of 1,524 corresponds to the most ambitious of the precision objectives given in section 2.4.2.

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[7] In the initial design, there were to have been six data collections. Subsequently, this has been reduced to five data collections.

[8] The effective sample size may be computed as $(\sum w_i)^2 / \sum w_i^2$, where w_i is the weight of sampled element *i*. Note that, as defined here, the effective sample size compensates only for variation in weights; it does not compensate for the effects of clustering.

2.4.2 Original Precision Objectives

The following are the original ECLS-B precision objectives. The most ambitious of these objectives (5A below) implied a required effective sample size of 1,524 completed interviews (4,572 for the White, non-Hispanic subgroup) at the 9-month data collection, with a resultant sample size of 1,248 at the sixth data collection. The first four objectives concern the relative standard errors of cross-sectional estimates, and the last two concern the power of significance tests.

- 1(A). Consider a sample estimate of the population percentage of a subgroup with a given characteristic at 9 months. The relative standard error (RSE) of the sample estimate (p) may be approximated by

  $$\mathrm{RSE}(p) = \sqrt{[1+(b-1)\rho](100-P)/nP} \ ,$$

  where b is the average subgroup sample size per PSU, ρ is the intraclass correlation for the characteristic within PSUs, P is the population percentage of the subgroup with the characteristic, and n is the effective sample size.

  In this formula, $n = 1{,}524$ and, with 100 PSUs, $b = 15.24$. For illustrative purposes, it is assumed that $\rho = 0.04$, although this is probably high for most estimates. If P is 50 percent, then $\mathrm{RSE}(p) = 0.032$ (i.e., a relative standard error of about 3 percent).

- 1(B). If P is 30 percent, $\mathrm{RSE}(p) = 0.049$.

- 2(A). Consider next a similar estimate for a characteristic at the sixth data collection, with the effective sample size reduced to 1,248 because of attrition. Applying the formula above with n = 1,248 and b = 12.48 yields $\mathrm{RSE}(p) = 0.034$ for $P = 50$ percent and

- 2(B). $\mathrm{RSE}(p) = 0.052$ for $P = 30$ percent.

- 3. Consider an estimate of a population mean $\overline{Y} = 50$ with a standard deviation of $S = 15$ at wave 1. The relative standard error of the sample estimate ($\overline{y}$) may be approximated by

  $$\mathrm{RSE}(\overline{y}) = (S/\overline{Y})\sqrt{[1+(b-1)\rho]/n} \ ,$$

  where the notation is as defined above. Again, for illustrative purposes, $\rho = 0.04$. Then $\mathrm{RSE}(\overline{y}) = 0.010$.

- 4. Consider the example above but for the sixth data collection with the smaller effective sample size. In this case $\mathrm{RSE}(\bar{y})$ is increased but, with rounding, it remains at 0.010.

- 5(A). Consider now a significance test to determine whether there is a difference between the percentages of children with a given characteristic in two mutually exclusive analytic subgroups. Suppose that in one subgroup the percentage is 30 percent and in the other it is 36 percent (i.e., 20 percent larger). For simplicity, the samples are treated as independent, ignoring the correlation occurring because both samples are drawn from the same PSUs; as a result, the power calculated here is an underestimate. Assume 9-month effective sample sizes of 1,524 for each group. For the calculations these are reduced by dividing by $1+(b-1)\rho = 1.5696$ (with $\rho = 0.04$) to deal with clustering effects. Based on the above numbers, a two-tailed test and a 5 percent significance level, the power of the test is about 0.80.

- 5(B). An equivalent test for the sixth data collection, with the reduced sample size, would have a power of about 0.75.

- 6(A). Finally, consider a significance test to determine whether there has been a change in a percentage between an earlier data collection and this sixth within a subgroup. For simplicity assume that the analysis is restricted to the sixth data collection respondents and that all 1,248 of the sixth data collection respondents were respondents at the earlier wave. Also assume that the correlation of the responses between the two waves is 0.6 and that the true change is a 20 percent increase from $P_1 = 30$ percent at the earlier wave to $P_2 = 36$ percent at the sixth data collection. For this situation, with a two-tailed test and a significance level of 5 percent, the power of the test is almost 99 percent.

- 6(B). With a 1 percent significance level, the power is a little over 94 percent.

2.4.3 Expected Response Rates

The response rates assumed for the ECLS-B were based on Westat's recent experience on other large national panel studies and on response rates reported by other organizations on panel surveys. Table 4 presents a comparison of data collection response rates for three longitudinal surveys: the Medicare Current Beneficiary Survey (MCBS), the Medical Expenditure Panel Survey—Household Component (MEPS), and the Survey of Income and Program Participation (SIPP). The first two surveys are continuing Westat studies, and the last is conducted by the U.S. Census Bureau. The data in table 4 suggest that initial interview response has declined since 1990, with a lesser amount of decline and higher response rates for the Census Bureau survey. Bates (2003) reports that nonresponse for first interviews increased by 4-7 percentage points over the years 1990–2001 for most of the major national recurring surveys—the Current Population Survey (CPS), the National Crime Victimization Survey (NCVS), the

National Health Interview Survey (HIS) and the Survey of Income and Program Participation (SIPP). Table 4 also seems to conform to the conventional wisdom that the Census Bureau enjoys a few response rate points advantage over private organizations. However, this advantage is decidedly less pronounced during the later data collections of these surveys.

Table 4. Comparison of response rates by data collection for selected panel surveys, in percent: Selected years 1991–2007

Data collection response rates								
Survey	Panel	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Overall response rate
MCBS[1]	1991	87	94	96	97	98	98	73.0
	1992	84	95	96	97	98	99	71.4
	1993	83	95	98	96	98	98	71.1
	1994	83	95	97	97	98	99	71.4
	1995	83	94	98	97	†	†	†
	1996	83	†	†	†	†	†	†
MEPS[2]	1996	83	95	96	†	†	†	†
	1997	83	†	†	†	†	†	†
SIPP[3]	1990	93	94	98	98	97	98	79.8
	1991	92	94	98	98	98	99	79.8
	1992	91	94	98	98	97	98	78.7
	1993	91	94	98	98	98	97	77.6
ECLS-B	Predicted	85	93	95	96	98	98.5	69.5

† Not applicable.
[1] Medicare Current Beneficiary Survey.
[2] Medical Expenditure Panel Survey.
[3] Survey of Income and Program Participation.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

The initial sample for MEPS comes from completed National Health Interview Survey (NHIS) interviews. There is up to a year-and-a-half lag between the NHIS and the first MEPS contact attempt. About 3.5 percent of these initial contacts are never successful because households are unlocatable, all members of a household have died or are similarly isolated from contact, or no proxy is available for the ill or incapacitated. The comparable rate for MCBS is about 3 percent. The MCBS sample comes from the Master Enrollment File maintained by the Centers for Medicare and Medicaid Services; initial addresses in the file are typically received from the Social Security Administration and may be 20 years old or older; although the file is updated periodically, updates are not obtained for all movers. Noncontact rates on the ECLS-B were expected to be very low because the birth record's address data was only several months before the anticipated first interview date. Thus, there was good reason to believe that the expected initial 9-month data collection rate of 85 percent was attainable and the rates at subsequent waves would be achieved. Table 5 gives the expected response rates for the ECLS-B, by data collections.

Table 5. Predicted response rates by data collection: 2001–07

Data collection	Response rate (percent)
Selected sample	100
1	85
2	93
3	95
4	96
5	98
6	98.5
Overall response	69.5

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001-02.

Nonrespondents to the 9-month data collection were excluded from subsequent data collections, whereas it was anticipated that nonrespondents to other data collections would be included in the efforts of subsequent collections. This distinction is made because of the expected qualitative differences between nonrespondents to the 9-month and those to subsequent data collection. That is to say, every effort was made to contact and recruit all sampled cases for the 9-month data collection. Inability to obtain response to the 9-month data collection occurred because of a failure to locate the sampled case, a failure to contact the case after numerous attempts, hostile refusals, or where significant refusal conversion had not been successful. In each of these cases, the reasons for nonresponse at the 9-month wave were severe enough that little return on any further efforts in subsequent waves was anticipated. In contrast, it was anticipated that nonrespondents to other data collections (24 months, etc.) would be much more likely to respond at another time. For example, it was believed that a 24-month nonrespondent was reasonably expected to participate at 48 months, given that he or she participated at 9 months.

2.4.4 Sample Size as a Random Variable

The actual sample sizes achieved for the various analytic subgroups in the ECLS-B were expected to be somewhat different from the targeted numbers. This can occur for a variety of reasons, including differences between actual and expected response rates, misclassification rates, and infant mortality rates. Changes in the year 2001 birth population relative to the population data used to set sampling rates would also result in differences between actual and expected sample sizes.

In addition, the actual ECLS-B subgroup sample sizes are random variables that are subject to variability just as the ECLS-B estimates are subject to sampling error. That is to say, there would be some variation in the actual ECLS-B sample sizes across repeated implementations of the sample design even if the rates discussed above were correct and the sampling rates were correct relative to the year 2001 births and target sample sizes. However, the random variation was expected to be relatively small given the systematic selection of births across time within each PSU. This variability was compensated for by slightly increasing the initial ECLS-B subgroup sample sizes. The compensation made it more likely that the actual and effective sample sizes would stay at or above a level that met the ECLS-B precision requirements. The compensation applied to all subgroups except the White, non-Hispanic; normal birth weight; and single births and other non-twins subgroups, which already had a sample size in excess of that needed to meet the ECLS-B precision requirements. The increase in sample size required for each of the other subgroups was roughly calculated by assuming that the effective sample size for each subgroup is a random variable following a Poisson distribution with a mean equal to the expected sample size and a standard error equal to the square root of the expected sample size. Under these assumptions, an adjusted effective sample size was calculated that gives a 95 percent probability of meeting or exceeding the target effective sample size by solving the following equation:

$$a_{hij} - (1.645)\sqrt{a_{hij}} = t_{hij} \ ,$$

where

a_{hij} = the adjusted effective sample size for a particular subgroup and
t_{hij} = the target effective sample size for a particular subgroup (1,524).

Solving the equation for t_{hij} = 1,524 yielded an adjusted effective sample size of 1,590. The Poisson distribution was used as an approximation to the binomial distribution followed by the expected sample sizes.

2.4.5 Mathematical Programming Solution for Sample Allocation

As discussed above, the required effective sample size for each of the analytic subgroups (excluding the normal birth weight, single births and other non-twins, and White, non-Hispanic subgroups) was set at 1,590. This section describes how these effective sample sizes were achieved, taking account of the overlap between subgroups and the differential weights.

The ECLS-B analytic domains can be considered as three separate stratification factors, each with a particular number of levels. Thus, the race/ethnicity domain has six levels (White, Black, Asian/Pacific Islander, Hispanic, Chinese and American Indian); the birth weight domain has three levels (very low birth weight [i.e., <1,500 grams], moderately low birth weight [i.e., 1,500 ≤ x < 2,500 grams], and normal birth weight); and the twins domain has two levels (twins, single births and other non-twins). Treating each domain as a stratification factor, the sample allocation problem was handled as a multidimensional stratification problem. Specifically, a three-dimensional problem can be visualized as a cube with 36 cells (6 x 3 x 2 levels) with precision requirements on the margins. This kind of problem has been solved in the literature (e.g., Causey, Cox, and Ernst 1985 and Green 2000 for a summary) as either a linear or a mathematical programming problem. Three specifications are required for solving such a problem:

1. A set of decision variables;
2. An objective function in terms of the decision variables to be maximized, minimized, or to approach a particular value; and
3. A set of constraints on the decision variables.

This three-dimensional stratification problem can be dealt with as follows:

- Making the sample sizes per cell the decision variables;
- Defining the objective function as the sum of the sample sizes per cell, and specifying that the value of this function is minimized;
- Requiring that the sample sizes per cell be greater than or equal to one and less than or equal to the population size per cell; and
- Requiring that the effective sample sizes by level of domain to be greater than or equal to the targets effective sample size.

An additional specification is required to calculate the variance effects of differential weighting by level of domain and hence the effective sample sizes by level of domain.

The problem was expressed in the following mathematical programming notation:

Minimize: $$\sum^{H}\sum^{I}\sum^{J} n_{hij}\ ;$$

Subject to: $$n_{hij} \geq 1\ ;$$

$$n_{hij} \leq N_{hij}\ ;$$

$$\frac{\sum^{I}\sum^{J} n_{hij}}{d_h} \geq t_h\ ;$$

$$\frac{\sum^{H}\sum^{J} n_{hij}}{d_i} \geq t_i\ ;$$

$$\frac{\sum^{H}\sum^{I} n_{hij}}{d_j} \geq t_j\ ;$$

where

n_{hij}	is the actual sample size in cell hij,
N_{hij}	is the population size in cell hij,
t_h, t_i, t_j	are the target effective sample sizes of levels *h*, *i*, *j* in domains *H*, and *I*, *J*; and
$d_h = \frac{n_h}{N_h^2}\sum^{I}\sum^{J}\frac{N_{hij}^2}{n_{hij}}$	and so forth., are the variance effects of differential weighting for levels *h*, *i*, *j* in domains *H*, *I*, *J* (Kish 1992).

2.4.6 Solving for Initial Required Number of 9-Month Completes

The solutions for 9-month completes that satisfy the constraints given in section 2.4.5 while minimizing the total sample size were obtained using the Solver feature within Excel. Table 6 gives the initial required number of 9-month completes for each cell, yielding a total sample of 13,659 9-month completes. These are the initial required number of 9-month completes. The required number of 9-month completes was reduced later in the study (section 2.5). These 9-month completes, in turn, determined the number of births to be sampled given response rate and infant mortality assumptions (see section 2.4.9).

Table 7 gives the number of initial required 9-month completes for each analytic subgroup, along with the design effect from differential weighting—labeled the weighting effect—and the effective sample size. This table shows that the 9-month completes given in table 6 satisfy the 9-month target of a minimum effective sample size of 1,590 for each analytic subgroup (except for Asian/Pacific Islanders, Chinese, and American Indians); for non-Hispanic Whites, the target is 4,572, and that is also satisfied.

2.4.7 Expected Sixth Round Data Collection Yields

The expected numbers of sixth round data collection[9] completes are easily calculated based on the expected number of actual 9-month completes given in table 7 and the response rates assumed in table 5. The expected numbers of sixth data collection completes are about 81.9 percent of the 9-month completes. They are given in table 8, together with the weighting effects and effective sample sizes, for sixth data collection analytic subgroups.

[9] In the initial design, there were to have been six data collections. This was subsequently reduced to five data collections.

Table 6. Initial required 9-month completes by race/ethnicity, birth weight, and plurality

Race/ethnicity	Birth weight	Total	Twins	Single births and other non-twins
Total		13,659	1,890	11,769
American Indian/Alaska Native	Very low	162	40	122
American Indian/Alaska Native	Moderately low	202	85	117
American Indian/Alaska Native	Normal	886	96	790
Chinese	Very low	6	1	5
Chinese	Moderately low	26	6	20
Chinese	Normal	508	5	503
Other Asian/Pacific Islander	Very low	48	7	41
Other Asian/Pacific Islander	Moderately low	102	20	82
Other Asian/Pacific Islander	Normal	1,203	18	1,185
Hispanic	Very low	220	37	183
Hispanic	Moderately low	262	85	177
Hispanic	Normal	1,487	89	1,398
Black, non-Hispanic	Very low	525	90	435
Black, non-Hispanic	Moderately low	451	130	321
Black, non-Hispanic	Normal	1,313	92	1,221
White, non-Hispanic, and all others	Very low	795	180	615
White, non-Hispanic, and all others	Moderately low	1,016	428	588
White, non-Hispanic, and all others	Normal	4,447	481	3,966

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 7. Initial required 9-month completes, weighting effects, and effective 9-month completes by level of domain: 2001–02

Characteristic	Initial required 9-month completes	Weighting effect	Effective 9-month completes
Total	13,659	1.5150	9,016
Race/ethnicity			
American Indian/Alaska Native	1,250	1.0500	1,190
Chinese	540	1.0032	538
Asian/Pacific Islander	1,353	1.0230	1,323
Hispanic	1,969	1.2375	1,591
Black, non-Hispanic	2,289	1.4393	1,590
White, non-Hispanic, and all others	6,258	1.3689	4,572
Birth weight			
Very low (less than 1,500 grams)	1,756	1.0026	1,751
Moderately low (≥ 1,500 and < 2,500 grams	2,059	1.1671	1,764
Normal (2,500 grams or more)	9,844	1.2517	7,864
Plurality			
Twin	1,890	1.0499	1,800
Non-twin (single birth and other multiple births)	11,769	1.3750	8,559

NOTE: Detail may not sum to totals due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 8. Sixth data collection completes, weighting effects, and effective sample sizes by level of domain (projected)

Characteristic	Sixth data collection completes	Weighting effect	Effective sample size
Total	11,183	1.5150	7,381[1]
Race/ethnicity			
American Indian/Alaska Native	1,023	1.0500	975
Chinese	442	1.0032	441
Other Asian/Pacific Islander	1,108	1.0230	1,083
Hispanic	1,612	1.2375	1,303
Black, non-Hispanic	1,874	1.4393	1,302
White, non-Hispanic, and all others	5,123	1.3689	3,743
Birth weight			
Very low birth weight (less than 1,500 grams)	1,438	1.0026	1,434
Moderately low birth weight (≥1,500 < 2,500 grams)	1,686	1.1671	1,444
Normal birth weight (2,500 or more grams)	8,059	1.2517	6,439
Plurality			
Twin	1,547	1.0499	1,474
Non-twin (single birth and other multiple births)	9,635	1.3750	7,007

[1] The total effective sample size is not necessarily equal to the sum of effective sample sizes across the levels of a domain.
NOTE: Detail may not sum to totals due to rounding. As noted earlier, in the initial design, there were to have been six data collections. Subsequently, this was reduced to five data collections.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

The weighting effects in table 8 are equal to the weighting effects used in table 7, which relates to 9 months. However, the overall design effects of survey estimates may be different at different waves. In addition to the weighting effects, the overall design effects for the sixth data collection would have been dependent on the following:

- The average cluster size for the sixth data collection, which would be lower than that for the 9-month data collection;
- The intraclass correlation at the sixth data collection, which may have been lower than that at the 9-month due to children moving to new locations between the 9-month and the sixth data collections and being exposed to different environments; and

- Nonresponse weighting adjustments, which would have been larger at the sixth data collection than at the 9-month data collection because of sample attrition.

2.4.8 Race/Ethnicity Misclassification

A child's race and ethnicity are not collected on the U.S. Standard Certificate of Live Birth. A child's race and ethnicity were designated for sampling purposes based on a function of the race and ethnicity reported for the mother and the father on the birth certificate. See section 2.7.1 for details. Inevitably, there was some misclassification involved in this sampling designation, for three reasons. First, the race and ethnicity reported for the mother and the father on the birth certificate might not be accurate. Second, the child's sample designation may have differed from what was reported for the child in the ECLS-B 9-month parent interview. Third, the 2001 birth certificate data did not capture multi-race responses, whereas the 9-month parent interview captured multi-race responses. The two methods of classifying race/ethnicity also differed in the classification of cases as Hispanic. Furthermore, the classification of a multi-race response into a single race category is not straightforward and would not necessarily agree with the response to a single race question. The ECLS-B 9-month response is generally likely to be the preferred variable for analysis purposes. Table 9 gives the cross-classification of the child's sampling (W1CRAC) and parent report (X1CHRACE) of race/ethnicity.

For any given analysis, users will need to decide how to define race/ethnicity. Using the American Indian population as an example, 873 completed cases were classified as American Indian for sampling purposes (W1CRAC), but only 286 were classified as American Indian for the composite of child's race (X1CHRACE). For sampling purposes, a case was classified as American Indian if either parent reported that the child was American Indian. For the composite X1CHRACE, a much more stringent definition was used. To be classified as American Indian for X1CHRACE, three conditions needed to be met: (1) the parent reported that the child was American Indian; (2) the parent did not report any other race for the child (e.g., American Indian and White or American Indian and Black); and (3) the parent reported that the child was not Hispanic. As can be seen in table 9, 286 cases met this more stringent definition. The file also contains dichotomous race variables (X1CHAMIN, X1CHASN, X1CHPIC, X1CHBLCK, X1CHWT, X1CHHISP, and X1CHMLRC) that can be used to subset the sample by race. These composites take values of "1" whenever a particular race/ethnicity is reported regardless of whether other races or ethnicities are also reported. For the dichotomous American Indian composite (X1CHAMIN), 749 cases were classified as American Indian, much closer to the number

Table 9. Cross-classification of child's sampling and parent report of race/ethnicity, 9-month data collection: 2001–02

Child's race/ethnicity from sampling (W1CRAC)	Total	Parent report of child's race/ethnicity (X1CHRACE)								
		American Indian or Alaska Native, non Hispanic	Asian, non-Hispanic	Native Hawaiian or other Pacific Islander, non-Hispanic	Hispanic, race specified	Hispanic, no race specified	Black, non-Hispanic	White, non-Hispanic	More than 1 race	Not ascertained
Total	10,688	293	1,195	49	1,514	679	1,698	4,441	780	39
American Indian	873	286	14	2	148	24	16	127	250	6
Chinese	466	1	458	1	0	0	0	0	1	5
Other Asian/Pacific Islander	1,345	2	712	40	122	21	22	108	305	13
Hispanic	1,581	0	0	0	974	560	8	34	3	2
Black, non-Hispanic	1,771	0	2	3	53	12	1,619	13	65	4
White, non-Hispanic	4,652	4	9	3	217	62	33	4,159	156	9

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Nine-Month Data Collection, 2001–02.

obtained using the sampling definition (873). Users will need to consider carefully which of these available race/ethnicity variables are best suited for their purposes or whether they want to create their own categorizations of race/ethnicity.

Race/ethnicity misclassification can cause some loss in sampling efficiency. The loss was expected to be minor for White, non-Hispanics, Black, non-Hispanics, and Hispanics since the overall sampling fractions for these subgroups were similar. However, because of the substantially larger sampling fraction used for Asian/Pacific Islander children, misclassification was a more serious issue for this subgroup. Asian/Pacific Islander children classified otherwise for sampling purposes would have been sampled at a lower rate and children falsely classified as Asian/Pacific Islanders would have been oversampled. The former type of misclassification is the more serious, but the latter is also of some concern.

The NCHS study of the comparability of birth certificate data with responses to the 1988 Maternal and Infant Health Survey (Schoendorf et al. 1993) provided some evidence on the misclassification issue. That study found that 216 mothers were so classified on the mother's questionnaire. There were 203 mothers who were classified as Asian/Pacific Islander by both sources. (Note that the sample contained an overrepresentation of low birth weight and Black infants, but no adjustments were made to compensate for this in the above numbers. Also, both sources had some cases where race is missing.) There were changes in both directions, with a net effect of more Asian/Pacific Islanders being reported on the mother's questionnaire.

The loss of efficiency for the Asian/Pacific Islander subgroup arising from race/ethnicity misclassifications could have been counteracted by selecting a larger sample of children classified as Asians or Pacific Islanders from data on their birth certificates. The increase in sample size needed to address both the reduction in the subgroup sample size from the assignment of some children sampled as Asians or Pacific Islanders to other subgroups and the addition of children classified in another subgroup for sampling purposes who turned out to be Asian or Pacific Islanders. The problem with the additional - children is that they were sampled at lower rates, and hence had much larger weights than those sampled as Asians or Pacific Islanders. The resultant variation in weights decreases the precision of the estimates for this subgroup. Approximate calculations indicated that the Asian/Pacific Islander subgroup sample size needed to be increased by 25 percent to fully compensate for the misclassification effect.

Another approach for addressing the misclassification problem would increase the likelihood that an Asian or Pacific Islander child is so classified for sampling purposes. An attempt was made to achieve this outcome by assigning a child with either parent reported as Asian or Pacific Islander on the birth certificate to this subgroup for sampling purposes. See exhibit 4-1 in chapter 4 of the *Nine-Month User's Manual.* Given this sampling classification decision, the adopted modification to the sample sizes outlined earlier was to increase the sample of children classified as Asian/Pacific Islander according to the mother's or father's race/ethnicity not by the full 25 percent, but by a compromise 10 percent. This 10 percent increase is reflected in subsequent tables (but not in tables 6, 7 and 8), since it was factored in at this point in the calculation of required sample sizes and sampling rates. American Indians were also identified as having either parent reported as American Indian on the birth certificate, although an increase in the sampling rate was not applied.

2.4.9 Adjustments for Infant Mortality

The initial sample sizes required need to be adjusted for infant mortality. The 9-month sample aims to represent children living at 9 months of age. Infant deaths prior to this age are not nonresponse, but they do reduce the sample size. Although all analytic subgroups experience some infant mortality, the issue is particularly important for the very low birth weight, and to a lesser extent, for the moderately low birth weight subgroups. The infant mortality rate for the former subgroup was expected to be approximately 26 percent, while that for the latter subgroup was expected to be approximately 1.7 percent. The infant mortality rate for the normal birth weight group was expected to be 0.27 percent (table 18).

Adjustments for infant mortality can be readily made at the level of the three sampling domains, using data available in the standard NCHS monthly vital statistics reports. These reports do not provide information at the level of the 36 separate groups used for sampling (e.g., see table 6), but adjustments for infant mortality made on the basis of birth weight (i.e., very low birth weight, moderately low birth weight, normal birth weight) should suffice.

Infant mortality adjustments were built into the initial sample sizes required. Most of the infant deaths should occur early enough for the states to successfully screen sampled births against death records and inform NCHS of the deaths prior to the fielding of the cases. Thus, contacting the household involved will be avoided. This expectation is based on data that indicate over 65 percent of infant mortality occurs within the first 27 days of life (MacDorman and Atkinson 1998).

2.4.10 Required Initial Sample Sizes

Adjusting the 9-month sample sizes presented in tables 6 and 7 for the expected 9-month response rate, race/ethnicity misclassification rates, and infant mortality rates leads to the required initial sample sizes given in tables 10 and 11. These are the sample sizes in the various subgroups that Westat expected to select initially. Some died before reaching the age of 9 months and some were 9-month nonrespondents. No data would be collected for these cases at any wave (no attempt will be made to contact 9-month nonrespondents at later waves).

Table 10. Initial required sample sizes by cell, 9-month data collection: 2001–02

Race/ethnicity	Birth weight	Total	Twins	Single births and other non-twins
Total		17,095	2,397	14,698
American Indian/Alaska Native	Very low	258	64	194
American Indian/Alaska Native	Moderately low	242	102	140
American Indian/Alaska Native	Normal	1,045	113	932
Chinese	Very low	12	2	9
Chinese	Moderately low	34	8	26
Chinese	Normal	660	7	653
Other Asian/Pacific Islander	Very low	84	12	71
Other Asian/Pacific Islander	Moderately low	134	27	107
Other Asian/Pacific Islander	Normal	1,561	23	1,538
Hispanic	Very low	349	58	290
Hispanic	Moderately low	314	102	212
Hispanic	Normal	1,754	105	1,649
Black, non-Hispanic	Very low	835	144	691
Black, non-Hispanic	Moderately low	539	155	384
Black, non-Hispanic	Normal	1,549	108	1,441
White, non-Hispanic, and all others	Very low	1,264	286	978
White, non-Hispanic, and all others	Moderately low	1,216	512	704
White, non-Hispanic, and all others	Normal	5,247	568	4,679

NOTE: Detail may not sum to totals due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 11. Initial required sample sizes by level of domain, 9-month data collection: 2001–02

Characteristic	Initial sample size
Total	17,095
Race/ethnicity	
American Indian	1,545
Chinese	705
Other Asian/Pacific Islander	1,779
Hispanic	2,416
Black, non-Hispanic	2,923
White, non-Hispanic	7,728
Birth weight	
Very low (less than 1,500 grams)	2,801
Moderately low (≥1,500 and < 2,500 grams)	2,479
Normal (2,500 grams or more)	11,815
Plurality	
Twin	2,397
Non-twin (single birth or other multiple births)	14,698

NOTE: Detail may not sum to totals due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

These sample sizes were later revised to control costs (see section 2.5).

2.4.11 Sampling Birth Certificates Within Primary or Secondary Sampling Units

Individual birth certificates within PSUs or SSUs (hereafter PSUs) were sampled from data files provided by state registrars. These data files were processed through the NCHS state-based vital statistics system. Sampled children subsequently identified by state registrars as having died or having been adopted after the issuance of the birth certificate were excluded from the sample.

NCHS receives birth certificate data from the states on a flow basis, with the number of births received and months included in a given shipment varying by state and throughout the year. Births were thus sampled systematically throughout 2001 and 2002. The within-PSU sampling rates varied by case stratum and depended on the PSU selection probability such that, within each case stratum, each sampled birth had an equal overall probability of selection. After a particular batch was received, births were selected within case strata, within PSUs present in the batch, based on appropriate selection intervals, continuing from the point where the last sample selection within PSU and case stratum left off.

The initial overall selection probabilities for each of the birth certificate sampling strata are given in table 12.

Table 12. Overall selection probabilities by case stratum, 9-month data collection: 2001–02

Case stratum		Race/ethnicity	Birth weight	Plurality	
				Twins	Not twins
31	32	American Indian/Alaska Native	Very low	0.0417	0.0370
33	34	American Indian/Alaska Native	Moderately low	0.0244	0.0244
35	36	American Indian/Alaska Native	Normal	0.0244	0.0244
25	26	Chinese	Very low	0.0556	0.0500
27	28	Chinese	Moderately low	0.0278	0.0227
29	30	Chinese	Normal	0.0270	0.0213
13	14	Other Asian/Pacific Islander	Very low	0.0476	0.0435
15	16	Other Asian/Pacific Islander	Moderately low	0.0208	0.0125
17	18	Other Asian/Pacific Islander	Normal	0.0192	0.0106
1	2	Hispanic	Very low	0.0417	0.0370
3	4	Hispanic	Moderately low	0.0161	0.0061
5	6	Hispanic	Normal	0.0149	0.0022
7	8	Black, non-Hispanic	Very low	0.0417	0.0370
9	10	Black, non-Hispanic	Moderately low	0.0161	0.0061
11	12	Black, non-Hispanic	Normal	0.0149	0.0024
19	20	White, non-Hispanic/other	Very low	0.0417	0.0370
21	22	White, non-Hispanic/other	Moderately low	0.0161	0.0059
23	24	White, non-Hispanic/other	Normal	0.0147	0.0017

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

The within-PSU sampling rate for a case stratum depended on the PSU selection probability and was determined to give each sampled birth in a given case stratum the same overall probability of selection. The within-PSU selection probability for each case stratum was determined from the following equation:

Sampling rate = $P_{hik} = P_k / P_{hi}$,

where

P_{hik} = the within-PSU selection probability for case stratum k in PSU i in PSU stratum h,

P_k = the desired overall selection probability for a birth in case stratum k; and

P_{hi} = probability of selection for ECLS-B PSU i in PSU stratum h.

Note that the within-PSU sampling rates cannot exceed 1. As can be seen from the above equation, this implies that the PSU selection probability must be no less than the overall selection probability for every case stratum. The construction of PSUs was carried out to satisfy this condition.

2.5 Sample Reduction

The 9-month sample was originally designed to yield 13,659 total completed parent interviews, including the American Indian supplement. However, it became necessary later to reduce the total sample size for budgetary reasons. The sample reduction was implemented via a reduction in the within-PSU sampling rates, which had the following features:

1. The expected actual 9-month parent completes were reduced about 20 percent overall, from 13,659 to 10,870.
2. The sample size for the Chinese subgroup was not reduced.
3. The sample size for the American Indian subgroup was reduced from 1,000 to 880.
4. In view of items (2) and (3) above, the reduction in the remaining 24 case strata was slightly greater than 20 percent.
5. Finalized cases (a subset of cases already in the field, where data collection was either complete, or the case was a final refusal, unlocatable, or ineligible) were exempt from the sample reduction.

Data collection began in October 2001 and was scheduled to end in December 2002. These changes were first implemented on March 5, 2002. The reductions in sample size were implemented by imposing another level of sampling. After the introduction of subsampling on March 5, 2002, minor adjustments to the sampling fractions were made approximately 2 weeks later. The two sets of sampling fractions are shown in tables 13 and 14. The rates remained in place for the duration of 2002.

Table 13. Sampling rates used in Phase I, reduction of cases fielded prior to March 5, 2002

Stratum		Race/ethnicity	Birth weight	Plurality	
				Twins	Not twins
31	32	American Indian/Alaska Native	Very low	0.7773	0.7773
33	34	American Indian/Alaska Native	Moderately low	0.7773	0.7773
35	36	American Indian/Alaska Native	Normal	0.7773	0.7773
25	26	Chinese	Very low	0.9524	0.9524
27	28	Chinese	Moderately low	0.9524	0.9524
29	30	Chinese	Normal	0.9524	0.9524
13	14	Other Asian/Pacific Islander	Very low	0.6623	0.6623
15	16	Other Asian/Pacific Islander	Moderately low	0.6623	0.6623
17	18	Other Asian/Pacific Islander	Normal	0.6623	0.6623
1	2	Hispanic	Very low	0.6623	0.6623
3	4	Hispanic	Moderately low	0.6623	0.6623
5	6	Hispanic	Normal	0.6623	0.6623
7	8	Black, non-Hispanic	Very low	0.6623	0.6623
9	10	Black, non-Hispanic	Moderately low	0.6623	0.6623
11	12	Black, non-Hispanic	Normal	0.6623	0.6623
19	20	White, non-Hispanic/other	Very low	0.6623	0.6623
21	22	White, non-Hispanic/other	Moderately low	0.6623	0.6623
23	24	White, non-Hispanic/other	Normal	0.6623	0.6623

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 14. Sampling rates used in Phase II and III, cases fielded after March 5, 2002

Stratum		Race/ethnicity	Birth weight	Plurality	
				Twins	Not twins
31	32	American Indian/Alaska Native	Very low	0.8102	0.8102
33	34	American Indian/Alaska Native	Moderately low	0.8102	0.8102
35	36	American Indian/Alaska Native	Normal	0.8102	0.8102
25	26	Chinese	Very low	1.0000	1.0000
27	28	Chinese	Moderately low	1.0000	1.0000
29	30	Chinese	Normal	1.0000	1.0000
13	14	Other Asian/Pacific Islander	Very low	0.4535	0.4535
15	16	Other Asian/Pacific Islander	Moderately low	0.4535	0.4535
17	18	Other Asian/Pacific Islander	Normal	0.4535	0.4535
1	2	Hispanic	Very low	0.5939	0.5939
3	4	Hispanic	Moderately low	0.5939	0.5939
5	6	Hispanic	Normal	0.5939	0.5939
7	8	Black, non-Hispanic	Very low	0.7094	0.7094
9	10	Black, non-Hispanic	Moderately low	0.7094	0.7094
11	12	Black, non-Hispanic	Normal	0.7094	0.7094
19	20	White, non-Hispanic/other	Very low	0.7122	0.7122
21	22	White, non-Hispanic/other	Moderately low	0.7122	0.7122
23	24	White, non-Hispanic/other	Normal	0.7122	0.7122

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

The sample reduction occurred in three phases. First, sampling rates were applied to nonexempt (see above) cases in the field. These sampling rates are shown in table 13. For example, 66.2 percent of Hispanic births that had been fielded but not yet complete were selected for continued data collection.

In Phases II and III, sampling rates were applied to reduce cases that had already been sampled but not yet fielded. In Phase III, sampling rates were applied to new cases sampled after March 5, 2002. Sampling rates for Phases II and III were identical.

These reductions in sample size, and thus counts of completed cases, had implications for the precision objectives listed in section 2.4.2. These implications were reviewed at the time sample reductions were being discussed. Table 15 gives the original and revised precision for the scenarios listed in section 2.4.2. Generally speaking, the expected increase in relative standard errors (RSEs) was less than 8 percent and the expected loss in power was less than 12 percent. See section 2.7.4 for the actual RSEs for selected estimates.

Table 15. Original and revised sample sizes and precision, and percent change, 9-month data collection: 2001–02

Precision scenario[1]	Original: Original sample size	Original: Relative standard error (percent)	Original: Power	Revised: Revised sample size	Revised: Relative standard error (percent)	Revised: Power	Change (percent)
1A	1,524	3.2	†	1,219	3.5	†	7.7
1B	1,524	4.9	†	1,219	5.3	†	6.8
2A	1,248	3.4	†	998	3.7	†	6.8
2B	1,248	5.2	†	998	5.7	†	7.7
3	1,524	1.0	†	1,219	1.0	†	3.9
4	1,248	1.0	†	998	1.1	†	7.2
5A	1,524	†	80	1,219	†	72	-10.0
5B	1,248	†	75	998	†	66	-12.0
6A	1,248	†	99	998	†	98	-1.2
6B	1,248	†	94	998	†	92	-2.3

† Not applicable.
[1] See section 2.4.2.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

2.6 Expected and Actual 9-Month Yields

Before reporting actual 9-month yields, the complexity of the ECLS-B instruments must be acknowledged. The 9-month data collection consisted of three main components: data were collected from the parent, using computer-assisted personal interviewing (CAPI) and a self-administered questionnaire, from child assessments and observations, and from the father (resident father, nonresident father or both) with a self-administered questionnaire. The parent CAPI instrument was required for all cases included in the respondent data file. Table 16 details the number of cases with 9-month data, by component (Parent, Child and Father), overall and for each analytic subgroup. See chapter 4 for a more thorough discussion of component combinations and sets of weights. Note also that these are actual sample sizes. See chapter 4 for discussion of design effects, which work to reduce these actual sample sizes to effective sample sizes. Note that some of the cases included in table 16 are ineligible due to deaths and adoptions. Such cases could not be identified at the time of sampling and excluded, unlike children born to mothers less than 15 years of age. (See section 2.1 for the description of the ECLS-B target population.)

Table 16. Number of cases with component data, overall and by domain, 9-month data collection: 2001–02

Characteristic	Sample	Target parent completes	Completed interviews: Parent	Parent-child	Parent-father	Parent-child-father
Total	14,197	10,870	10,688	10,221	6,988	6,816
Race/ethnicity[1]						
American Indian	1,086	880	873	835	551	542
Chinese	732	637	466	418	352	324
Other Asian/Pacific Islander	1,832	1,209	1,345	1,287	885	871
Hispanic	2,096	1,517	1,581	1,501	918	900
Black, non-Hispanic	2,161	1,746	1,771	1,715	817	802
White, non-Hispanic	6,014	4,881	4,652	4,465	3,465	3,377
Ineligible[2]	276	†	†	†	†	†
Birth weight						
Very low (less than 2,500 grams)	1,473	1,268	1,151	1,093	709	685
Moderately low (≥ 1,500 < 2,500 grams)	2,055	1,512	1,647	1,585	1,037	1,013
Normal (2,500 or more grams)	10,393	8,090	7,890	7,543	5,242	5,118
Ineligible[2]	276	†	†	†	†	†
Plurality						
Twin	2,023	1,357	1,658	1,585	1,141	1,113
Non-twin (single birth or other multiple births)	11,898	9,513	9,030	8,636	5,847	5,703
Ineligible[2]	276	†	†	†	†	†

† Not applicable.
[1] Race/ethnicity information was determined from the birth certificate as defined in exhibit 3.
[2] Ineligible cases include deaths and adoptions.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort, Nine-Month Data Collection, 2001–02.

2.7 Evaluation of Design Assumptions

The ability of the ECLS-B sample design to achieve the expected sample sizes depended on the accuracy of the design assumptions and their associated estimates. First, the size of the 2001 birth population could vary from the ECLS-B design estimate, either in the aggregate or for one or more of the subgroups. Section 2.7.1 compares the actual population size with the design estimates, both overall and by subgroup. Second, the actual infant mortality rates could vary from the design assumptions, again either in the aggregate or more importantly for the very low birth weight subgroup, in which they were expected to be large. Section 2.7.2 compares the actual infant mortality rates with the estimates, overall and by birth weight. Third, the actual response rate could be different from the expected; section 2.7.3 compares the two rates. Finally, any differences between the expected and actual population sizes, infant mortality rates, and response rates would result in deviations from the revised precision objectives described in section 2.5 (see. Section 2.7.4).

2.7.1 Population Size

As described in section 2.2.1, the 1994, 1995 and 1996 NCHS natality detail files were used to estimate the size of the 2001 birth population, both overall and by the domains (race/ethnicity, birth weight, plurality) described in section 2.4.1.

The race/ethnicity domains are mutually exclusive and exhaustive. The race/ethnicity of the infant was assigned based on hierarchical rules that used the mother and father's race/ethnicity as they appeared on the birth certificate. Note that birth certificate data do not specify the child's race/ethnicity individually. The hierarchical rules worked to implement specific definitions desired for certain subgroups (i.e., for the American Indian [mother or father] and Chinese subgroups [mother and father]) and to assign cases with missing or unknown race/ethnicity to subgroups with larger sampling rates (an approach that benefits smaller subgroups analytically. See the discussion in section 2.4.8. Exhibit 3 shows how a child's race/ethnicity for sampling was derived from the mother's and father's race/ethnicity as reported on the birth certificate. The hierarchical logic was as follows:

1. If the mother or father was reported as American Indian, then the child was classified as American Indian;

2. Otherwise, if the mother and father were reported as Chinese, then the child was classified as Chinese;

3. Otherwise, if the mother was reported as Chinese or Asian/Pacific Islander or the father was reported as Chinese or Asian/Pacific Islander, then the child was classified as Other Asian/Pacific Islander;

4. Otherwise, if the mother was reported as Hispanic, then the child was classified as Hispanic;

Exhibit 3. Rules for assigning infant's race/ethnicity based on parents' race/ethnicity from birth certificates, in 9-month data collection: 2001–02

Mother's race/ethnicity[1]	Father's race/ethnicity[1]						
	American Indian	Chinese	Other Asian/Pacific Islander (PI)	Hispanic	Black, non-Hispanic	White, non-Hispanic	Missing
American Indian	American Indian	American Indian	American Indian	American Indian	American Indian	American Indian	American Indian
Chinese	American Indian	Chinese	Other Asian/PI	Other Asian/PI	Other Asian/PI	Other Asian/PI	Other Asian/PI
Other Asian/Pacific Islander (PI)	American Indian	Other Asian/PI	Other Asian/PI	Other Asian/PI	Other Asian/PI	Other Asian/PI	Other Asian/PI
Hispanic	American Indian	Other Asian/PI	Other Asian/PI	Hispanic	Hispanic	Hispanic	Hispanic
Black, non-Hispanic	American Indian	Other Asian/PI	Other Asian/PI	Black, non-Hispanic	Black, non-Hispanic	Black, non-Hispanic	Black, non-Hispanic
White, non-Hispanic	American Indian	Other Asian/PI	Other Asian/PI	Hispanic	Black, non-Hispanic	White, non-Hispanic	White, non-Hispanic
Missing	American Indian	Other Asian/PI	Other Asian/PI	Hispanic	Black, non-Hispanic	White, non-Hispanic	Other Asian/PI

[1] In cases of multiple races, assignment to race/ethnicity is hierarchical from top to bottom for mother and from left to right for father. Thus, the child of a mother who is American Indian and Hispanic would be assigned race/ethnicity based on the first row of the table, i.e., "American Indian."
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Nine-Month Data Collection, 2001–02.

5. Otherwise, if the mother was reported as Black, non-Hispanic, then the child was classified as Black, non-Hispanic;

6. Otherwise, if the father was reported as Hispanic, then the child was classified as Hispanic;

7. Otherwise, if the father was reported as Black, non-Hispanic, then the child was classified as Black, non-Hispanic;

8. Otherwise, if the mother was reported as White, non-Hispanic or the father was reported as White, non-Hispanic, then the child was classified as White, non-Hispanic;

9. All remaining cases (both mother and father's race/ethnicity was reported as missing): the child was classified as Other Asian/Pacific Islander.

Table 17 presents the expected and actual 2001 birth population sizes, overall and by domain. Overall, the actual population size increased by 2.8 percent. However, there was significant variation in the percent change. The overall percent change, as well as the percent change for the Black, non-Hispanic, White, non-Hispanic, American Indian, moderately low birth weight, normal birth weight and non-twin domains was fairly small (i.e., less than 3 percent). The percent change for the Hispanic, Asian/Pacific Islander, Chinese, very low birth weight and twin domains was much larger, but all of these changes are due to true changes in the birth population from 1994–96 to 2001.

2.7.2 Infant Mortality

Since the very low birth weight and moderately low birth weight were analytic domains, and infant mortality varies considerably between these two groups, separate infant mortality rates were used to calculate sampling rates based on birth weight. Table 18 presents the expected and actual infant mortality rates, by birth weight. The percent of ECLS-B sample cases identified as infant deaths is actually higher, at 2.89 percent. This is due to the fact that some states were not able to distinguish between deaths and adoptions, and that the actual ECLS-B mortality rate (2.89 percent) is unweighted and therefore compares poorly with the other two overall rates, given the oversampling of the very low birth weight.

Table 17. Expected and actual 2001 birth population sizes and percent change, overall and by domain

Characteristic	Expected	Actual[1]	Percent change
Overall	3,914,617	4,023,742	2.8
Race/ethnicity			
Hispanic	676,196	836,949	23.8
Black	599,974	587,738	-2.0
Asian/Pacific Islander	133,746	150,650	12.6
White/American Indian[2]	2,477,215	2,424,699	-2.1
Chinese	27,486	23,706	-13.8
Birth weight			
Very low birth weight (less than 1,500 grams)	57,303	57,674	0.6
Moderately low birth weight (≥ 1,500 < 2,500 grams)	233,838	250,375	7.1
Normal birth weight (2,500 or more grams)	3,623,476	3,715,693	2.5
Plurality			
Twin	98,183	121,265	23.5
Non-twin (single birth or other multiple births)	3,816,434	3,902,477	2.3

[1] Derived from the 2001 National Center for Health Statistics Natality compact disc according to the rules described in section 2.7.1.
[2] American Indians were not accounted for separately in the original calculation of expected population sizes and overall sampling rates; they were considered part of the White race/ethnicity subgroup at that time.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 18. Expected and actual infant mortality rates, 9-month data collection: 2001–02

Birth weight	Expected (percent)[1]	Actual 2001 (percent)[2]
Overall	0.72	0.68
Very low (less than 1,500 grams)	26.3	24.44
Moderately low (≥1,500 < 2,500 grams)	1.67	1.52
Normal (2,500 or more grams)	0.27	0.24

[1] National Vital Statistics Reports, Volume 47 (23), Centers for Disease Control and Prevention, National Center for Health Statistics, 1999.
[2] National Vital Statistics Reports, Volume 52 (2), Centers for Disease Control and Prevention, National Center for Health Statistics, 2003.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

2.7.3 Response Rates

As described in section 2.4.3, an overall response rate of 85 percent was anticipated at the Parent level. The actual response rates varied by subgroup (see table 23 in section 3.3.2 and chapter 3 in general for more on response rates). The overall unweighted and weighted parent response rates conditional on PSU response were 76.8 percent and 74.1 percent, respectively. Some of the difference between the expected and actual response rates is probably attributable to a decline in response rates since the early to mid 1990s when the study was planned (see section 2.4.3).

2.7.4 Precision

As discussed in section 2.5 the original and revised precision requirements for ECLS-B included RSEs ≤ 6 percent. Tables 19 and 20 show that for most estimates, overall and by subgroup, the RSEs still meet these requirements. However, the RSEs presented in tables 19 and 20 show a range from 0 percent to 53 percent. Most RSEs in excess of 10 percent are for very small subgroups with sample sizes less than 100 or which were not planned domains of analysis (Native Hawaiian or other Pacific Islander, More than 1 race, non-Hispanic). The RSEs for a few other estimates (e.g., X1POVRTY, X1SESQ5, X1SESL, F1READBO, X1FTHED) exceed 10 percent despite larger sample sizes (n > 100). Only for X1SESL does the RSE exceed 10 percent even though the sample size exceeds 200. The components of socioeconomic status (SES) are standardized to have means of zero and unit standard deviation. These standardized components are averaged to calculate SES for each individual. As a result, X1SESL has small or near-zero mean values for most subgroups, but standard deviations that are approximately 1/sqrt(m), where m is the number of components averaged (m can vary from one individual to another). Because of this standardization, the RSE for X1SESL is inflated in comparison with the other variables considered here.

A large number of variables were collected from parents, children, and fathers in the ECLS-B. The estimate from each variable has its own relative standard error. Tables 19 and 20 show the estimate, relative standard error, and sample sizes for selected means and proportions based on ECLS-B parent, child, and father component data. The estimates presented for each item in tables 19 and 20 follow particular conventions. If the item is a continuous or interval measure, then the estimate is the mean for all cases (excluding “Don’t knows,” “Not ascertained”, etc.) If the item is discrete (i.e., nominal or ordinal), then the estimate is the proportion of cases responding with the first or lowest

Table 19. Estimates, relative standard errors, and sample size for the ECLS-B race/ethnicity subgroups, by variable names, 9-month data collection: 2001–02

Variable name / label	Overall	Race/ethnicity: White, non-Hispanic	Black or African American, non-Hispanic	Hispanic, race specified	Hispanic, no race specified	Asian, non-Hispanic	Native Hawaiian or other Pacific Islander	American Indian or Alaska Native, non-Hispanic	More than 1 race, non-Hispanic
X1FTHTYP / X1 TYPE RES FATHER-BIRTH/ADOPT/STEP/FOST									
Estimate	78.73	88.30	41.03	76.27	81.93	93.47	70.73	69.10	74.54
Relative standard error (%)	0.6	0.7	4.1	2.0	2.5	1.2	16.0	6.4	3.3
Sample size	8,304	3,902	696	1148	532	1,137	38	200	620
X1HFAMIL / X1 TYPE OF FAMILY									
Estimate	49.65	56.02	29.43	46.95	50.91	47.59	65.50	43.49	42.81
Relative standard error (%)	1.1	1.6	4.1	2.9	4.5	4.5	17.2	9.0	6.2
Sample size	5,558	2,757	522	739	354	620	33	139	374
X1HPARNT / X1 CH PARENTS WHO RESIDE IN HOUSEHOLD									
Estimate	78.55	88.10	40.91	76.26	81.63	93.39	70.73	64.95	74.51
Relative standard error (%)	0.6	0.7	4.1	2.0	2.5	1.2	16.0	5.5	3.3
Sample size	8,282	3,889	693	1147	531	1,136	38	198	619
X1IFTHLB / X1 HH FATHER/MALE GUARD-WRK STAT W/IMP									
Estimate	94.59	96.40	91.05	91.58	90.86	94.23	94.68	87.26	95.75
Relative standard error (%)	0.4	0.4	1.7	0.9	1.6	1.2	3.5	3.2	1.2
Sample size	7,916	3,793	649	1,070	486	1,081	37	177	595
X1IMOMLB / X1 HH MOTHER/FEMALE GUARD-WRK STAT W/IMP									
Estimate	60.28	59.69	73.39	53.60	56.20	48.43	58.62	67.84	67.61
Relative standard error (%)	1.5	2.2	1.8	3.4	4.6	3.8	20.1	5.5	3.9
Sample size	6,221	2,531	1,194	790	371	613	31	189	481
X1POVRTY / X1 POVERTY INDICATOR									
Estimate	22.87	11.93	45.74	31.68	39.47	12.90	‡	46.69	20.79
Relative standard error (%)	2.6	5.3	4.0	5.1	7.1	11.6	‡	7.2	11.9
Sample size	2,603	591	778	496	276	137	‡	131	166
X1PRIMNW / X1 PRIM CARE ARRNGMNT WHERE MOST HRS/WK									
Estimate	49.95	51.34	36.98	54.78	53.34	53.21	66.18	53.54	44.50
Relative standard error (%)	1.6	2.3	4.4	3.3	3.4	3.8	15.0	5.5	6.5
Sample size	5,352	2,307	657	837	361	588	32	156	389

See note at end of table.

Table 19. Estimates, relative standard errors, and sample size for the ECLS-B race/ethnicity subgroups, by variable names, 9-month data collection: 2001–02—Continued

Variable name / label	Overall	White, non-Hispanic	Black or African American, non-Hispanic	Hispanic, race specified	Hispanic, no race specified	Asian, non-Hispanic	Native Hawaiian or other Pacific Islander	American Indian or Alaska Native, non-Hispanic	More than 1 race, non-Hispanic
X1SESQ5 / X1 QUINTILE INDICATOR FOR SOCIOECON SCAL									
Estimate	20.05	8.61	34.37	33.64	46.59	10.24	‡	32.72	15.12
Relative standard error (%)	2.3	5.4	4.9	5.3	5.4	12.6	‡	8.0	12.3
Sample size	2,110	416	567	509	300	106	‡	89	107
X1FSSCAL / X1HSHLD FOOD SECURITY-SCALE SCR (RASCH)									
Estimate	3.66	3.67	3.73	3.57	3.63	3.62	‡	3.36	3.91
Relative standard error (%)	1.7	3.6	3.0	3.0	3.8	4.4	‡	7.2	5.9
Sample size	2,485	696	569	472	275	152	‡	102	188
X1HTOTAL / X1 TOTAL / X1 TOTAL NUMBER OF HOUSEHOLD MEMBERS									
Estimate	4.31	4.12	4.40	4.60	4.81	4.37	5.05	4.89	4.16
Relative standard error (%)	0.4	0.6	1.0	1.1	1.7	1.5	9.1	2.5	2.4
Sample size	10,688	4,441	1,698	1,514	679	1,195	49	293	780
X1LESS18 / X1 NUMBER OF HH MEMBERS LESS THAN 18									
Estimate	2.13	2.01	2.44	2.22	2.31	1.85	2.50	2.58	2.05
Relative standard error (%)	0.6	1.0	1.7	1.8	2.7	2.6	9.1	4.3	3.5
Sample size	10,688	4,441	1,698	1,514	679	1,195	49	293	780
X1SESL / X1 FAMILY SOCIOECONOMIC SCALE									
Estimate	-0.08	0.20	-0.49	-0.43	-0.67	0.48	-0.54	-0.54	-0.07
Relative standard error (%)	10.0	7.0	6.3	6.0	4.2	9.2	19.3	8.9	52.9
Sample size	10,688	4,441	1,698	1,514	679	1,195	49	293	780
F1READBO / F1 Q2A HOW OFTEN READ BOOKS TO CHILD									
Estimate	27.88	26.53	30.04	29.82	28.67	32.25	‡	42.69	28.78
Relative standard error (%)	2.8	3.4	10.1	7.0	10.8	6.5	‡	19.7	14.5
Sample size	1,774	895	135	224	101	244	‡	50	113
N1FWTBBY / N1 Q9 FATHER WANTED CH WHEN BEC PRGNT									
Estimate	54.32	61.52	47.58	60.34	‡	‡	‡	74.83	53.37
Relative standard error (%)	5.1	10.6	7.7	8.5	‡	‡	‡	11.2	28.4
Sample size	363	77	157	46	‡	‡	‡	25	30

See note at end of table.

Table 19. Estimates, relative standard errors, and sample size for the ECLS-B race/ethnicity subgroups, by variable names, 9-month data collection: 2001–02—Continued

		Race/ethnicity							
Variable name / label	Overall	White, non-Hispanic	Black or African American, non-Hispanic	Hispanic, race specified	Hispanic, no race specified	Asian, non-Hispanic	Native Hawaiian or other Pacific Islander	American Indian or Alaska Native, non-Hispanic	More than 1 race, non-Hispanic
N1RELM / N1 Q13 HOW IS RELATIONSHIP W/CHILD'S MOTHER									
Estimate	79.18	74.49	83.44	73.17	76.92	‡	‡	80.62	87.29
Relative standard error (%)	2.9	7.2	3.8	7.7	11.2	‡	‡	6.5	7.1
Sample size	549	100	287	58	25	‡	‡	28	38
N1TALKM / N1 Q6 HOW OFTEN TALK WITH CHILD'S MOTHER									
Estimate	79.77	73.05	81.92	79.30	83.37	‡	‡	78.35	91.84
Relative standard error (%)	2.7	7.4	2.7	8.9	8.4	‡	‡	9.8	4.3
Sample size	540	91	275	67	28	‡	‡	26	41
X1FTHED / X1 RES FATHER HIGHEST EDUCATION LEVEL									
Estimate	6.74	0.99	‡	19.22	31.57	‡	†	‡	‡
Relative standard error (%)	6.6	25.7	‡	10.2	10.0	‡	†	‡	‡
Sample size	277	24	‡	122	106	‡	†	‡	‡
X1FTHTYP / X1 TYPE RES FATHER-BIRTH/ADOPT/STEP/FOST									
Estimate	86.15	92.50	52.34	86.12	88.63	97.81	‡	75.46	83.89
Relative standard error (%)	0.6	0.7	4.0	2.1	2.2	0.8	‡	5.7	3.6
Sample size	6218	3197	440	774	349	814	‡	136	465
X1HFEMP / X1 HH FATHER/MALE GUARD-WORK STATUS									
Estimate	85.6	90.40	76.93	78.39	74.22	85.21	‡	59.37	85.90
Relative standard error (%)	0.7	0.8	3.7	2.4	4.3	2.3	‡	15.4	2.9
Sample size	5,177	2,815	337	578	260	683	‡	91	382
X1NRFEMP / X1 NON-RES FATHER WORK STATUS									
Estimate	60.88	68.53	57.80	61.02	‡	‡	‡	‡	71.89
Relative standard error (%)	4.2	6.1	6.2	12.5	‡	‡	‡	‡	17.6
Sample size	362	88	162	44	‡	‡	‡	‡	25

See note at end of table.

Table 19. Estimates, relative standard errors, and sample size for the ECLS-B race/ethnicity subgroups, by variable names, 9-month data collection: 2001–02—Continued

Variable name / label	Overall	Race/ethnicity: White, non-Hispanic	Black or African American, non-Hispanic	Hispanic, race specified	Hispanic, no race specified	Asian, non-Hispanic	Native Hawaiian or other Pacific Islander	American Indian or Alaska Native, non-Hispanic	More than 1 race, non-Hispanic
X1FTHSCR / X1 HH FATHER-OCC GSS PRESTIGE SCORE									
Estimate	42.85	44.29	41.17	40.13	36.23	48.97	‡	38.43	42.10
Relative standard error (%)	0.4	0.6	1.3	1.2	1.2	1.2	‡	1.6	1.7
Sample size	5,674	3,031	378	663	289	745	‡	106	426
F1READBO / F1 Q2A HOW OFTEN READ BOOKS TO CHILD									
Estimate	28.03	26.71	29.61	30.52	28.15	32.08	‡	42.44	28.94
Relative standard error (%)	2.8	3.5	10.7	6.8	10.9	6.8	‡	20.1	14.9
Sample size	1,741	883	132	222	100	231	‡	49	112
N1FWTBBY / N1 Q9 FATHER WANTED CH WHEN BEC PRGNT									
Estimate	54.49	62.60	47.61	60.18	‡	‡	‡	74.62	53.10
Relative standard error (%)	4.8	9.3	7.4	10.4	‡	‡	‡	11.4	29.5
Sample size	352	74	155	44	‡	‡	‡	25	28
N1RELM / N1 Q13 HOW IS RELATIONSHIP W/CHILD'S MOTHER									
Estimate	79.24	74.32	82.88	75.24	‡	‡	‡	80.67	87.12
Relative standard error (%)	3.1	7.7	3.9	7.7	‡	‡	‡	6.5	7.2
Sample size	533	97	281	56	‡	‡	‡	28	35
N1TALKM / N1 Q6 HOW OFTEN TALK WITH CHILD'S MOTHER									
Estimate	79.08	72.19	81.25	78.00	83.42	‡	‡	78.40	91.69
Relative standard error (%)	2.9	7.9	2.8	9.3	8.4	‡	‡	9.8	4.4
Relative standard error	521	87	268	64	26	‡	‡	26	38
X1FTHED / X1 RES FATHER HIGHEST EDUCATION LEVEL									
Estimate	6.75	‡	‡	18.78	31.93	‡	†	‡	‡
Relative standard error (%)	6.7	‡	‡	10.5	10.0	‡	†	‡	‡
Sample size	269	‡	‡	117	106	‡	†	‡	‡
X1FTHTYP / X1 TYPE RES FATHER-BIRTH/ADOPT/STEP/FOST									
Estimate	86.14	92.51	52.21	86.32	88.43	97.75	‡	75.40	84.11
Relative standard error (%)	0.5	0.7	4.0	2.0	2.4	0.9	‡	5.8	3.5
Sample size	6,067	3,117	434	756	345	778	‡	134	460

See note at end of table.

Table 19. Estimates, relative standard errors, and sample size for the ECLS-B race/ethnicity subgroups, by variable names, 9-month data collection: 2001–02—Continued

Variable name / label	Overall	Race/ethnicity: White, non-Hispanic	Black or African American, non-Hispanic	Hispanic, race specified	Hispanic, no race specified	Asian, non-Hispanic	Native Hawaiian or other Pacific Islander	American Indian or Alaska Native, non-Hispanic	More than 1 race, non-Hispanic
X1HFEMP / X1 HH FATHER/MALE GUARD-WORK STATUS									
Estimate	85.54	90.34	76.62	78.41	73.88	85.38	‡	59.29	86.67
Relative standard error (%)	0.7	0.8	3.7	2.4	4.3	2.3	‡	15.6	2.9
Sample size	5,059	2,747	330	568	256	658	‡	90	379
X1NRFEMP / X1 NON-RES FATHER WORK STATUS									
Estimate	60.96	69.72	57.87	59.67	‡	‡	‡	‡	‡
Relative standard error (%)	4.2	6.4	6.5	13.0	‡	‡	‡	‡	‡
Sample size	352	85	160	42	‡	‡	‡	‡	‡
X1FTHSCR / X1 HH FATHER-OCC GSS PRESITGE SCORE									
Estimate	42.87	44.36	41.22	40.15	36.20	48.97	‡	38.42	41.99
Relative standard error (%)	0.4	0.5	1.4	1.2	1.2	1.3	‡	1.6	1.8
Sample size	5,538	2,957	371	650	285	712	‡	105	422
X1BTHWGT / X1 CHILD BIRTH WEIGHT STATUS									
Estimate	92.51	93.39	87.61	93	93.81	92.67	92.57	96.56	92
Relative standard error (%)	0.0	0.2	0.6	0.5	0.6	0.7	4.4	1.3	1.0
Sample size	7,501	2,982	989	1,084	492	1,010	37	261	612
X1CHSEX / X1 CHILD GENDER									
Estimate	51.06	51.57	51.29	49.41	51.67	52.49	62.13	52.18	48.04
Relative standard error (%)	0.2	1.4	2.6	3.5	3.9	3.7	19.2	10.0	5.5
Sample size	5,221	2,192	835	707	345	593	28	136	366
X1CHRACE / X1 RACE/ETHNICITY - CHILD									
Estimate	53.38	100	†	†	†	†	†	†	†
Relative standard error (%)	1.0	0.0	†	†	†	†	†	†	†
Sample size	4,262	4,262	†	†	†	†	†	†	†

See note at end of table.

Table 19. Estimates, relative standard errors, and sample size for the ECLS-B race/ethnicity subgroups, by variable names, 9-month data collection: 2001–02—Continued

Variable name / label	Overall	Race/ethnicity: White, non-Hispanic	Black or African American, non-Hispanic	Hispanic, race specified	Hispanic, no race specified	Asian, non-Hispanic	Native Hawaiian or other Pacific Islander	American Indian or Alaska Native, non-Hispanic	More than 1 race, non-Hispanic
X1MBRTST / X1 MULTIPLE BIRTH STATUS INDICATOR									
Estimate	96.82	96.24	96.91	97.87	97.61	97.84	97.19	98.15	97.31
Relative standard error (%)	0.0	0.1	0.2	0.2	0.3	0.3	2.6	0.8	0.4
Sample size	8,486	3,232	1,390	1,258	558	1,071	42	226	673
X1TWSAMP / X1 CHILD SAMPLED AS TWIN									
Estimate	2.94	3.4	2.97	2.03	2.34	1.99	‡	‡	2.6
Relative standard error (%)	1.0	2.6	6.6	10.0	13.3	14.8	‡	‡	14.0
Sample size	1,572	962	251	160	86	41	‡	‡	59
X1ASAGE / X1 CHILDS AGE AT TIME DIRECT ASSESSMENT (MONTHS)									
Estimate	10.48	10.45	10.48	10.52	10.55	10.55	10.24	11.43	10.45
Relative standard error (%)	0.5	0.6	0.8	0.6	1.3	0.6	2.7	2.0	1.3
Sample size	10,221	4,262	1,649	1,438	647	1,115	46	275	751
X1MTL2 / X1 MENTAL PROB2: EXPLORES PURPOSEFULLY									
Estimate	0.91	0.91	0.9	0.91	0.89	0.9	0.88	0.92	0.9
Relative standard error (%)	0.3	0.4	0.6	0.5	1.2	0.7	3.2	1.1	0.8
Relative standard error	10,195	4,249	1,646	1,436	645	1,112	45	274	750
X1MTLTSC / X1 MENTAL T-SCORE									
Estimate	50	50.59	49.63	49.66	48.19	48.47	47.79	47.44	50.3
Relative standard error (%)	0.4	0.6	0.9	0.9	1.2	0.9	3.7	1.6	1.1
Sample size	10,195	4,249	1,646	1,436	645	1,112	45	274	750
X1MTR2 / X1 MOTOR PROB2: SITTING									
Estimate	0.95	0.95	0.96	0.94	0.94	0.95	0.97	0.96	0.95
Relative standard error (%)	0.1	0.2	0.2	0.2	0.4	0.2	0.5	0.3	0.4
Sample size	10,166	4,240	1,639	1,432	643	1,106	45	274	749
X1MTRTSC / X MOTOR T-SCORE									
Estimate	50	49.67	52.49	48.81	49.5	50	55.28	50.43	51.36
Relative standard error (%)	0.4	0.5	0.7	0.8	0.9	0.7	2.1	1.5	1.1
Sample size	10,166	4,240	1,639	1,432	643	1,106	45	274	749

See note at end of table.

Table 19. Estimates, relative standard errors, and sample size for the ECLS-B race/ethnicity subgroups, by variable names, 9-month data collection 2001–02—Continued

		Race/ethnicity							
Variable name / label	Overall	White, non-Hispanic	Black or African American, non-Hispanic	Hispanic, race specified	Hispanic, no race specified	Asian, non-Hispanic	Native Hawaiian or other Pacific Islander	American Indian or Alaska Native, non-Hispanic	More than 1 race, non-Hispanic
X1NCATTS / X1 NCATS – TOTAL CHILD SCORE									
Estimate	50.18	50.94	49.47	49.22	48.34	49.61	49.54	48.79	50.49
Relative standard error (%)	0.2	0.3	0.4	0.4	0.6	0.5	6.0	1.3	0.6
Sample size	8,608	3,701	1,364	1,172	536	869	34	244	656

† Not applicable. The estimate has no cases to support it.

‡ Estimates based on sample sizes less than 25 are unreliable and are thus suppressed.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 20. Estimates, relative standard errors, and sample size for ECLS-B birth weight and plurality subgroups, by variable names, 9-month data collection: 2001–02

		Birth weight			Plurality		
Variable name / label	Overall	Normal	Moderately low	Very low	Singleton	Twin	Other multiple birth
X1FTHTYP / X1 TYPE RES FATHER-BIRTH/ADOPT/STEP/FOST							
Estimate	78.73	79.25	72.27	72.45	78.64	81.76	92.28
Relative standard error (%)	0.6	0.7	1.8	2.0	0.6	1.6	7.5
Sample size	8,304	6,221	1,221	831	6,835	1,346	75
X1HFAMIL / X1 TYPE OF FAMILY							
Estimate	49.65	49.85	47.41	45.16	48.55	82.19	98.95
Relative standard error (%)	1.1	1.2	2.7	4.0	1.1%	1.4	1.1
Sample size	5,558	4,067	931	535	4,099	1,346	76
X1HPARNT / X1 CH PARENTS WHO RESIDE IN HOUSEHOLD							
Estimate	78.55	79.09	71.89	72.15	78.46	81.62	92.28
Relative standard error (%)	0.6	0.6	1.9	2.1	0.6	1.6	7.5
Sample size	8,282	6,209	1,215	827	6,817	1342	75
X1IFTHLB / X1 HH FATHER/MALE GUARD-WRK STAT W/IMP							
Estimate	94.59	94.7	93.43	92.43	94.58	95.34	99.05
Relative standard error (%)	0.4	0.4	1.0	1.2	0.4	0.9	1.0
Sample size	7,916	5,939	1,169	778	6,512	1,287	76
X1IMOMLB / X1 HH MOTHER/FEMALE GUARD-WRK STAT W/IMP							
Estimate	60.28	60.46	59.41	51.34	60.54	52.63	43.71
Relative standard error (%)	1.5	1.6	2.3	3.2	1.6	2.8	21.6
Sample size	6,221	4,638	962	598	5,279	862	30
X1POVRTY / X1 POVERTY INDICATOR							
Estimate	22.87	22.5	27.51	26.94	22.84	22.37	‡
Relative standard error (%)	2.6	2.7	4.4	5.0	2.7	6.8	‡
Sample size	2,603	1,826	446	321	2,166	378	‡
X1PRIMNW / X1 PRIM CARE ARRNGMNT WHERE MOST HRS/WK							
Estimate	49.95	49.9	49.47	55.17	49.87	52.14	47.54
Relative standard error (%)	1.6	1.6	3.2	2.9	1.6	3.1	17.8
Sample size	5,352	3,913	801	614	4,411	857	39

See note at end of table.

Table 20. Estimates, relative standard errors, and sample size for ECLS-B birth weight and plurality subgroups, by variable names, 9-month data collection: 2001–02—Continued

Variable name / label	Overall	Birth weight: Normal	Birth weight: Moderately low	Birth weight: Very low	Plurality: Singleton	Plurality: Twin	Plurality: Other multiple birth
X1SESQ5 / X1 QUINTILE INDICATOR FOR SOCIOECON SCAL							
Estimate	20.05	19.76	24.08	21.55	20.18	15.78	‡
Relative standard error (%)	2.3	2.3	5.2	6.1	2.3	8.3	‡
Sample size	2,110	1,498	356	250	1,818	257	‡
X1FSSCAL / X1 HSHLD FOOD SECURITY-SCALE SCR (RASCH)							
Estimate	3.66	3.67	3.58	3.68	3.66	3.87	‡
Relative standard error (%)	1.7	1.7	3.3	3.6	1.7	3.5	‡
Sample size	2,485	1,761	426	290	2,113	333	‡
X1HTOTAL / X1 TOTAL NUMBER OF HOUSEHOLD MEMBERS							
Estimate	4.31	4.3	4.45	4.48	4.28	5.16	5.98
Relative standard error (%)	0.4	0.4	1.0	1.3	0.4	0.9	3.0
Sample size	10,688	7,844	1,647	1,155	8,873	1,658	77
X1LESS18 / X1 NUMBER OF HH MEMBERS LESS THAN 18							
Estimate	2.13	2.12	2.29	2.28	2.1	3.04	3.9
Relative standard error (%)	0.6	0.7	1.5	2.1	0.6	1.3	4.7
Sample size	10,688	7,844	1,647	1,155	8,873	1,658	77
X1SESL / X1 FAMILY SOCIOECONOMIC SCALE							
Estimate	-0.08	-0.07	-0.21	-0.2	-0.09	0.12	0.4
Relative standard error (%)	10.0	11.4	11.4	13.0	8.9	21.7	25.3
Sample size	10,688	7,844	1,647	1,155	8,873	1,658	77
F1READBO / F1 Q2A HOW OFTEN READ BOOKS TO CHILD							
Estimate	27.88	27.39	34.73	35.55	27.83	28.22	43.42
Relative standard error (%)	2.8	2.9	6.8	6.1	2.8	8.3	21.3
Sample size	1,774	1,272	283	212	1,431	307	25
N1FWTBBY / N1 Q9 FATHER WANTED CH WHEN BEC PRGNT							
Estimate	54.32	54.26	52.11	67.73	54.67	36.76	†
Relative standard error (%)	5.1	5.6	10.6	7.9	5.2	24.2	†
Sample size	363	253	54	55	325	33	†

See note at end of table.

Table 20. Estimates, relative standard errors, and sample size for ECLS-B birth weight and plurality subgroups, by variable names, 9-month data collection: 2001–02—Continued

Variable name / label	Overall	Birth weight: Normal	Birth weight: Moderately low	Birth weight: Very low	Plurality: Singleton	Plurality: Twin	Plurality: Other multiple birth
N1RELM / N1 Q13 HOW IS RELATIONSHIP W/CHILD'S MOTHER							
Estimate	79.18	79.15	77.79	86.83	79.25	74.91	†
Relative standard error (%)	2.9	3.1	6.8	6.0	3.0	8.7	†
Sample size	549	387	83	77	482	59	†
N1TALKM / N1 Q6 HOW OFTEN TALK WITH CHILD'S MOTHER							
Estimate	79.77	79.48	82.16	83.55	79.77	81.96	†
Relative standard error (%)	2.7	2.9	5.9	5.8	2.8	9.1	†
Sample size	540	378	90	70	474	61	†
X1FTHED / X1 RES FATHER HIGHEST EDUCATION LEVEL							
Estimate	6.74	6.88	4.12	7.55	6.8	5.14	‡
Relative standard error (%)	6.6	7.0	25.0	19.5	6.7	18.4	‡
Sample size	277	214	27	34	240	36	‡
X1FTHTYP / X1 TYPE RES FATHER-BIRTH/ADOPT/STEP/FOST							
Estimate	86.15	86.51	81.59	80.73	86.08	88.83	89.26
Relative standard error (%)	0.6	0.6	2.5	2.5	0.6	1.6	10.7
Sample size	6,218	4,669	914	611	5,079	1,052	56
X1HFEMP / X1 HH FATHER/MALE GUARD-WORK STATUS							
Estimate	85.6	85.84	81.92	83.71	85.55	87.68	94.84
Relative standard error (%)	0.7	0.8	2.1	2.0	0.7	1.9	3.0
Sample size	5,177	3,905	757	491	4,197	910	51
X1NRFEMP / X1 NON-RES FATHER WORK STATUS							
Estimate	60.88	61.77	53.79	43.8	60.79	65.13	†
Relative standard error (%)	4.2	4.4	10.8	18.3	4.2	12.6	†
Sample size	362	270	56	35	314	43	†

See note at end of table.

Table 20. Estimates, relative standard errors, and sample size for ECLS-B birth weight and plurality subgroups, by variable names, 9-month data collection: 2001–02—Continued

Variable name /label	Overall	Birth weight: Normal	Birth weight: Moderately low	Birth weight: Very low	Plurality: Singleton	Plurality: Twin	Plurality: Other multiple birth
X1FTHSCR / X1 HH FATHER-OCC GSS PRESTIGE SCORE							
Estimate	42.85	42.9	42.04	41.76	42.81	43.74	46.62
Relative standard error (%)	0.4	0.4	1.0	1.0	0.4	1.1	4.6
Sample size	5,674	4,263	840	545	4,612	986	56
F1READBO / F1 Q2A HOW OFTEN READ BOOKS TO CHILD							
Estimate	28.03	27.51	35.26	35.53	27.96	28.86	43.67
Relative standard error (%)	2.8	2.9	7.0	6.0	2.9	8.2	21.1
Sample size	1,741	1,248	278	208	1,401	304	25
N1FWTBBY / N1 Q9 FATHER WANTED CH WHEN BEC PRGNT							
Estimate	54.49	54.64	49.9	67.53	54.87	35.68	†
Relative standard error (%)	4.8	5.3	11.8	8.4	4.9	26.9	†
Sample size	352	249	50	52	316	31	†
N1RELM / N1 Q13 HOW IS RELATIONSHIP W/CHILD'S MOTHER							
Estimate	79.24	79.13	78.68	86.98	79.3	75.14	†
Relative standard error (%)	3.1	3.3	6.9	6.6	3.1	8.8	†
Sample size	533	378	80	73	468	57	†
N1TALKM / N1 Q6 HOW OFTEN TALK WITH CHILD'S MOTHER							
Estimate	79.08	78.83	81.24	82.26	79.06	82.44	†
Relative standard error (%)	2.9	3.0	6.3	6.2	2.9	9.1	†
Sample size	521	368	86	65	457	59	†
X1FTHED / X1 RES FATHER HIGHEST EDUCATION LEVEL							
Estimate	6.75	6.89	4.22	7.08	6.8	5.35	‡
Relative standard error (%)	6.7	7.0	24.8	20.4	6.8	18.3	‡
Sample size	269	209	27	32	232	36	‡
X1FTHTYP / X1 TYPE RES FATHER-BIRTH/ADOPT/STEP/FOST							
Estimate	86.14	86.49	81.78	81.03	86.08	88.84	89.41
Relative standard error (%)	0.5	0.6	2.6	2.5	0.6	1.7	10.5
Sample size	6,067	4,558	895	592	4,954	1,027	55

See note at end of table.

Table 20. Estimates, relative standard errors, and sample size for ECLS-B birth weight and plurality subgroups, by variable names, 9-month data collection: 2001–02—Continued

		Birth weight			Plurality		
Variable name / label	Overall	Normal	Moderately low	Very low	Singleton	Twin	Other multiple birth
X1HFEMP / X1 HH FATHER/MALE GUARD-WORK STATUS							
Estimate	85.54	85.76	82.01	84.05	85.48	87.63	94.88
Relative standard error (%)	0.7	0.8	2.1	1.8	0.7	2.0	3.0
Sample size	5,059	3,817	744	476	4,098	892	50
X1NRFEMP / X1 NON-RES FATHER WORK STATUS							
Estimate	60.96	61.78	54.06	46.1	60.89	64.18	†
Relative standard error (%)	4.2	4.5	11.4	18.1	4.3	13.4	†
Sample size	352	264	53	34	306	41	†
X1FTHSCR / X1 HH FATHER-OCC GSS PRESTIGE SCORE							
Estimate	42.87	42.93	42.15	41.95	42.84	43.73	46.77
Relative standard error (%)	0.4	0.4	1.0	1.0	0.4	1.2	4.6
Sample size	5,538	4,163	822	529	4,499	964	55
X1BTHWGT / X1 CHILD BIRTH WEIGHT STATUS							
Estimate	92.51	100	†	†	94.09	46.52	†
Relative standard error (%)	0.0	0.0	†	†	0.0	3.1	†
Sample size	7,501	7,501	†	†	6,800	630	†
X1CHSEX / X1 CHILD GENDER							
Estimate	51.06	51.34	47.06	50.15	51.11	50.19	45.8
Relative standard error (%)	0.2	0.2	2.8	3.6	0.2	3.7	16.4
Sample size	5,221	3,884	764	552	4,356	798	34
X1CHRACE / X1 RACE/ETHNICITY - CHILD							
Estimate	53.38	53.89	47.91	43.13	53.14	62.11	81.43
Relative standard error (%)	1.0	1.1	2.4	4.6	1.0	2.2	5.9
Sample size	4,262	2,982	779	478	3,232	969	56

See note at end of table.

Table 20. Estimates, relative standard errors, and sample size for ECLS-B birth weight and plurality subgroups, by variable names, 9-month data collection: 2001–02—Continued

		Birth weight			Plurality		
Variable name / label	Overall	Normal	Moderately low	Very low	Singleton	Twin	Other multiple birth
X1MBRTST / X1 MULTIPLE BIRTH STATUS INDICATOR							
Estimate	96.82	98.5	76.54	74.94	100	†	†
Relative standard error (%)	0.0	0.0	1.0	1.9	0.0	†	†
Sample size	8,486	6,800	865	788	8,486	†	†
X1TWSAMP / X1 CHILD SAMPLED AS TWIN							
Estimate	2.94	1.47	21.55	18.32	†	98.26	†
Relative standard error (%)	1.0	3.1	3.4	6.6	†	1.0	†
Sample size	1,572	629	695	245	†	1,572	†
X1ASAGE / X1 CHILDS AGE AT TIME DIRECT ASSESSMENT (MONTHS)							
Estimate	10.48	10.46	10.64	11.36	10.48	10.47	10.33
Relative standard error (%)	0.5	0.5	0.6	0.7	0.5	0.7	1.8
Sample size	10,221	7,501	1,585	1,097	8,486	1,585	74
X1MTL2 / X1 MENTAL PROB2: EXPOLORES PURPOSEFULLY							
Estimate	0.91	0.91	0.88	0.81	0.91	0.86	0.82
Relative standard error (%)	0.3	0.3	0.6	1.4	0.3	0.8	3.2
Sample size	10,195	7,492	1,583	1,082	8,467	1,578	74
X1MTLTSC / X1 MENTAL T-SCORE							
Estimate	50	49.98	49.92	51.73	50.06	48.02	52.7
Relative standard error (%)	0.4	0.4	0.6	0.8	0.4	0.8	2.2
Sample size	10,195	7,492	1,583	1,082	8,467	1,578	74
X1MTR2 / X1 MOTOR PROB2: SITTING							
Estimate	0.95	0.95	0.93	0.86	0.95	0.92	0.88
Relative standard error (%)	0.1	0.1	0.3	0.7	0.1	0.3	1.5
Sample size	10,166	7,483	1,574	1,071	8,451	1,565	74
X1MTRTSC / X1 MOTOR T-SCORE							
Estimate	50	50.17	48.2	46.24	50.1	46.75	48.09
Relative standard error (%)	0.4	0.4	0.7	0.9	0.4	0.7	2.3
Sample size	10,166	7,483	1,574	1,071	8,451	1,565	74

See note at end of table.

Table 20. Estimates, relative standard errors, and sample size for ECLS-B birth weight and plurality subgroups, by variable names, 9-month data collection: 2001–02—Continued

Variable name / label	Overall	Birth weight: Normal	Birth weight: Moderately low	Birth weight: Very low	Plurality: Singleton	Plurality: Twin	Plurality: Other multiple birth
X1NCATTS / X1 NCATS – TOTAL CHILD SCORE							
Estimate	50.18	50.25	49.52	48.6	50.21	49.64	47.65
Relative standard error (%)	0.2	0.2	0.4	0.4	0.2	0.4	2.1
Sample size	8,608	6,353	1,323	899	7,167	1,307	62

† Not applicable. This estimate has no cases to support it.
‡ Estimates based on sample sizes less than 25 are unreliable and are thus suppressed.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

possible meaningful value in an ordinal sense (excluding "Don't knows," "Not ascertained" etc.). For more information on the variables used in this section, refer to chapter 3 of the *Nine-Month User's Manual*, which describes the assessment and rating scale scores used in the ECLS-B, and chapter 7 of the *Nine-Month User's Manual*, which has a detailed discussion of the other variables. See Section 4.3.3 of the *Nine-Month User's Manual* for more discussion on the precision of these and other variables.

2.8 Probabilities of Selection and Base Weights

Probabilities of selection are the basis for calculating adjusted weights. These probabilities depend on the methods used at each stage of sample selection. This section presents:

- Selection probabilities for the core sample;
- Selection probabilities for the American Indian supplemental sample;
- Selection probabilities for substitute PSUs and alternative frames; and
- Base weights reflecting the above.

2.8.1 Selection Probabilities for the Core Sample

2.8.1.1 Primary Sampling Unit Selection Probabilities

PSUs were selected with probability proportional to the measures of size (MOS) described in section 2.2.1. PSUs with the largest MOS were selected with certainty and assigned a PSU probability of selection of 1.0. Smaller PSUs were grouped into homogeneous strata of approximately equal size (in terms of MOS). Two "noncertainty" PSUs were selected with PPS from each stratum using a without replacement sampling method as defined by Durbin (1967). The resulting selection probabilities were

$$p_{hi}^{c} = \frac{2M_{hi}}{\sum_{i=1}^{N_h} M_{hi}}$$

where M_{hi} is the weighted number of births for PSU i in stratum h, N_h is the number of PSUs in stratum h, and the index c is used to signify the core sample.

2.8.1.2 Secondary Sampling Unit Selection Probabilities

The conditional selection probability for the *j-th* SSU within the *hi-th* PSU, conditional on the *hi-th* PSU being selected, is denoted by $p_{j|hi}^{c}$. When a PSU could not be subdivided, the SSU selection probability is $p_{j|hi}^{c} = 1$. SSUs within PSUs that could be subdivided fell into one of two categories. Very large SSUs were selected with certainty. For these SSUs, the selection probability was $p_{j|hi}^{c} = 1$. Smaller SSUs were selected using PPS. The subdivision and selection of SSUs did not always affect all case strata. Data collection for rare domains, such as very low birth weight and Chinese, was still undertaken across the entire PSU in some cases. Thus for some case strata, the SSU selection probability could be 1.0 even though the PSU had been subdivided.

2.8.1.3 Birth Certificate Selection Probabilities

The selection probabilities for birth certificates in the 36 case strata,,excluding those for the American Indian births, were derived to meet the target sample sizes for each case stratum from the core sample. The selection probability for case stratum *k* for SSU *j* in PSU *hi* at time *t* is calculated as

$$p_{k|hij}^{ct} = \frac{p_{k}^{ct}}{p_{hi}^{c} p_{j|hi}^{c}}$$

where p_{k}^{ct} is the overall sampling rate for the given case stratum at time *t*. As noted in section 2.5, sampling rates were modified during data collection.

2.8.1.4 Overall Selection Probabilities and Base Weights

The overall probability of selection for a given birth in a non-American Indian case stratum is computed as the product of probabilities over all stages of sampling. For birth certificates sampled in case stratum *k* at time *t*, from the *j*-th SSU of the *hi*-th PSU, the selection probability is

$$p_{hijk}^{ct} = p_{hi}^{c} p_{j|hi}^{c} p_{k|hij}^{ct} .$$

Originally, the sample was designed to yield a constant overall probability of selection for births belonging to a given case stratum. Exceptions to this rule are due to sampling for the American Indian supplement, as described in section 2.8.2, and the reduction in sampling rates described in section 2.5.

The base weight for a given birth record is given by the reciprocal of the overall probability of selection:

$$w_{hijk}^{ct} = \frac{1}{p_{hijk}^{ct}}.$$

The base weight is the starting point for weight adjustments (see chapter 4).

2.8.2 Selection Probabilities for the American Indian Supplemental Sample

For the original ($t = 1$) core sample, American Indian births were placed in the "White, non-Hispanic" race/ethnicity group to be sampled at the appropriate rates for the case strata involving that domain. Based on the sampling rates for "White, non-Hispanic" births given in table 2-11, those rates (with the superscript *c* denoting the core sample) were as follows:

- Twin, very low birth weight: r^{c1} = 4.17 percent;
- Non-twin, very low birth weight: r^{c1} = 3.70 percent;
- Twin, moderately low birth weight: r^{c1} = 1.61 percent;
- Non-twin, moderately low birth weight: r^{c1} = 0.59 percent;
- Twin, normal birth weight: r^{c1} = 1.47 percent; and
- Non-twin, normal birth weight: r^{c1} = 0.17 percent.

Subsequently it was decided to treat the American Indian births as a separate analytic domain and to select a sample that would yield about 1,000 9-month Parent completes for them. This sample size implied an overall sampling rate of 2.41 percent for American Indian births, a rate larger than those given above for all case strata except the first two that involved very low birth weight infants. The additional sample was achieved by supplementing the core sample in two ways:

1. By adding the sample of American Indian births in the supplemental American Indian PSU sample as described in section 2.2.3. The overall sampling rates for the various case strata in the American Indian supplemental PSUs were set to be equal to the differences between the core rates given above and 2.41 percent. The rates for the two very low birth weight strata were set equal to 0.

2. By increasing the sampling rates for case strata involving American Indian births in counties in sampled core PSUs that were not covered by the supplemental American Indian PSU frame. The increases in the rates were the same as the overall rates for the supplemental American Indian PSU sample given in (1) above.

The full supplemental American Indian sample, composed of both (1) and (2), is a national sample of American Indian births selected at the rates needed to produce the desired American Indian sample size (i.e., apart from very low birth weight infants). For counties sampled in both the core SSU sample and the supplemental American Indian PSU sample, both the core and supplemental sample rates were applied. This was achieved by adding the two rates in a county and applying the summed rate in that county. Note that the sampling rates given above are the original rates that were revised later in the year (see section 2.5). However, the approach described remained applicable, and was employed with the revised rates.

2.8.2.1 Integration of Core and Supplemental Samples

As described above, American Indian births could be sampled in two ways. First, in the core sample, American Indian births were sampled as part of the White, non-Hispanic case strata. Second, a supplemental sample of American Indian births was selected from (1) a special PSU frame of areas with higher prevalence of American Indian births, and (2) counties in core PSUs not covered by the American Indian supplemental frame.

In sampling American Indian births, there were four possible situations with regard to core SSUs and the American Indian PSU frame, as depicted in exhibit 4. The four cases, along with the implications for sampling of American Indian birth certificates, are described as follows:

1. No county in a sampled core SSU is covered by the American Indian PSU sampling frame. In this case, the sample of American Indian birth certificates selected in the

SSU supports both the American Indian supplemental sample and American Indian births in the White, non-Hispanic domain of the core sample. Thus, American Indian births were sampled at rates to cover both the White, non-Hispanic domain of the core sample and the American Indian supplemental sample.

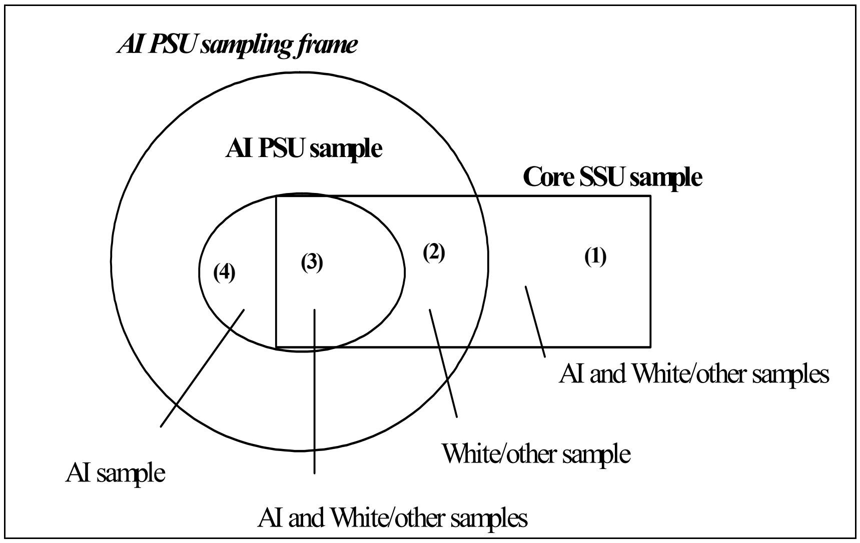
2. A sampled core SSU contains counties covered by the American Indian PSU sampling frame but does not overlap any of the sampled American Indian PSUs. In this case, the core SSU overlaps a nonsampled part of the American Indian PSU frame. As noted earlier, American Indian births in the American Indian PSU frame were sampled for the American Indian supplemental sample only if the American Indian PSU was sampled for the supplemental sample. Thus, in this case, American Indian births were sampled only as part of the White, non-Hispanic domain of the core sample in the counties in the American Indian PSU frame. In other counties in the SSU, American Indian births were sampled at rates to cover both the core and American Indian supplemental sample.

3. A sampled core SSU contains one or more counties that are part of a sampled American Indian PSU. In this case, because the overlap is sampled for both the core and supplemental samples, American Indian births were sampled in the overlap part for both the White, non-Hispanic domain of the core sample and the American Indian supplemental sample. In counties in the SSU that were not covered by the American Indian supplemental PSU frame, American Indian births were also sampled at the combined core and supplemental rates.

4. A sampled American Indian PSU does not overlap any sampled core PSU. In this case, American Indian births were sampled for only the American Indian supplemental sample.

Exhibit 4. Relationship between core and American Indian (AI) frames and samples, 9-month data collection: 2001–02

Core SSU sampling frame



NOTE: This figure shows the overlap between the core SSU and supplemental PSU samples. The text indicates whether American Indians are sampled through the American Indian supplement or through the "White, non-Hispanic" sampling domain.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

2.8.2.2 Selection Probabilities for the American Indian Supplemental PSU Sample

The calculation of PSU selection probabilities for the American Indian supplemental PSU sample follows the same principles as the core sample. In the supplemental frame, PSUs with the largest measures of size were selected with certainty and were assigned a PSU probability of selection of 1.0.

Each of these large PSUs became a stratum. Smaller PSUs were grouped into strata of approximately equal size, with two PSUs selected per stratum. The resulting selection probabilities were

$$p_{hi}^{s} = \frac{2M_{hi}^{s}}{\sum_{i=1}^{N_h^s} M_{hi}^{s}}$$

where M_{hi}^{s} is the estimated number of American Indian births in supplemental (*s*) PSU *i* in stratum *h* of the American Indian supplemental frame, and N_h^s is the number of American Indian PSUs in stratum *h*.

2.8.2.3 Within-Primary Sampling Unit Sampling Rates

Each of the four cases discussed above has implications for selection probabilities. The formulas for the subsampling rates for the four cases are given below. In these formulas, $p_{hij}^{c} = p_{hi}^{c} p_{j|hi}^{c}$ denotes the selection probability of core SSU *hij*, and p_{hi}^{s} denotes the selection probability of American Indian PSU *hi*. The overall selection probabilities for the various domain strata in the core sample at time *t* are denoted by r_k^{ct}; the initial values of r_k^{ct} are given in table 12. The overall selection rate for American Indian births was initially set at 0.0241. The initial overall selection probabilities for the various domain strata in the supplemental American Indian sample are given by $r_k^{s1} = \text{Max}\,(0.0241 - r_k^{c1}, 0)$. Thus for very low birth weight American Indian births, $r_k^{s1} = 0$. The later sample reduction (see section 2.5) was achieved by subsampling cases at a constant rate within each domain.

Case 1. In the first case, where a selected core SSU has no counties overlapping with the PSUs on the American Indian PSU frame, the subsampling rates for American Indian births throughout the SSU are given by

$$p_{k|hij(ns)}^{t} = \frac{r_k^{ct} + r_k^{st}}{p_{hij}^{c}}$$

where (*ns*) indicates that the counties are not covered by the American Indian supplemental PSU frame. Since American Indian births can be selected in such SSUs only through the core sample, American Indian births must be sampled at the overall sampling rate of 0.0241 (except in the case of very low birth weight infants who are sampled at a higher rate).

Case 2. If some county or counties in a core SSU overlap with counties in the PSUs on the American Indian PSU frame, but no overlap counties were selected for the American Indian sample, the subsampling rates for American Indian births in the overlapping counties (with (*s*) indicating that they are on the American Indian supplemental PSU frame) are given by

$$p^t_{k|hij(s)} = \frac{r^{ct}_k}{p^c_{hij}}.$$

The subsampling rates in the non-overlapping counties are as in Case 1 above, namely

$$p^t_{k|hij(ns)} = \frac{r^{ct}_k + r^{st}_k}{p^c_{hij}}.$$

Case 3. If some counties in a core SSU overlap with counties in selected American Indian PSUs, the subsampling rates for American Indian births in the overlapping counties are given by

$$p^t_{k|hij(s)} = \frac{r^{ct}_k}{p^c_{hij}} + \frac{r^{st}_k}{p^s_{hi}}.$$

In counties that do not overlap with the American Indian PSU frame, the subsampling rates are as in Case 1. In the core SSU and American Indian PSU samples selected, the situation in which a core SSU overlapped both sampled and nonsampled American Indian PSUs did not arise.

Case 4. If an American Indian PSU did not overlap any sampled core SSUs, then the subsampling rates are given by

$$p^t_{k|hi(s)} = \frac{r^{st}_k}{p^s_{hi}}.$$

2.8.2.4 Overall Selection Probabilities and Base Weights for American Indian Births

The overall probabilities of selection for American Indian births are computed as the product over all stages of sampling and need to take account of the two alternative routes of selection for American Indian births that can be selected via the American Indian supplemental PSU frame. The sampled American Indian births can be divided into two groups:

- **Group 1.** Those that could be sampled only via the core sample SSUs. The American Indian births in this group are those occurring in counties not covered by the American Indian supplemental PSU frame and all very low birth weight American Indian births. The overall selection probabilities for this group are readily determined using the procedures already described for the non-American Indian births in section 2.8.1.

- **Group 2.** Those that could be sampled **either** via the core sample SSUs **or** via the American Indian sample PSUs. This group comprises births occurring in counties in the PSUs on the American Indian frame that are not very low birth weight. It is this group that has two possible routes of selection.

Group 1 selection probabilities. For births that could be sampled only via the core sample SSUs, the selection probability for an American Indian birth is the product of three terms:

1. The probability that the PSU of occurrence was selected for the core sample;

2. The conditional probability that the SSU of residence was selected with the PSU; and

3. The conditional probability that the American Indian birth was selected in its domain stratum within the SSU at the time of selection.

This product is represented as follows:

$$p_{hijk}^{t} = p_{hi}^{c} p_{j|hi}^{c} p_{k|hij(ns)}^{t}$$

where the notation is as given earlier. The subsampling rates within SSUs are given by

$$p_{k|hij(ns)}^{t} = \frac{r_k^{ct} + r_k^{st}}{p_{hij}^{c}}.$$

where $p_{hij}^{c} = p_{hi}^{c} p_{j|hi}^{c}$. Thus, the overall probability reduces to

$$p_{hijk}^{t} = r_k^{ct} + r_k^{st}.$$

The base weights for sampled American Indian births from Group 1 are thus

$$w_{hijk}^{t} = \frac{1}{p_{hijk}^{t}} = \frac{1}{p_{hi}^{c} p_{j|hi}^{c} p_{k|hij(ns)}^{t}}.$$

Group 2 selection probabilities. Excluding the very low birth weight infants, the American Indian births that occur in counties that are covered by the American Indian PSU frame could be sampled for the ECLS-B under any of the following outcomes for the SSU core sample and American Indian PSU supplemental sample:

(a) Their county was part or all of core sample SSU but was not part of the American Indian PSU sample. The probability of this outcome is $p_{hij}^{c}(1-p_{hi}^{s})$. As indicated for Case 2 in section 2.8.2.3, the subsampling rates for American Indian births in such counties was $p_{k|hij(s)}^{t} = r_k^{ct} / p_{hij}^{c}$.

(b) Their county was part or all of a sampled American Indian PSU but was not part of the core SSU sample. The probability of this outcome is $p_{hi}^{s}(1-p_{hij}^{c})$. As indicated for case 4, the subsampling rates for American Indian births in such counties was $p_{k|hi(s)}^{t} = r_k^{st} / p_{hi}^{s}$.

(c) Both their core sample SSU and their American Indian PSU were sampled. The probability of this outcome is $p_{hij}^{c} p_{hi}^{s}$. As indicated for case 2, the subsampling rates for American Indian births in such counties was $p_{k|hij(s)}^{t} = (r_k^{ct} / p_{hij}^{c}) + (r_k^{st} / p_{hi}^{s})$.

The overall probability of an American Indian birth in Group 2 being selected is the sum of its probabilities under (a), (b), and (c). The overall probability is thus

$$\begin{aligned} p_{hijk}^{t} &= p_{hij}^{c}(1-p_{hi}^{s})\frac{r_k^{ct}}{p_{hij}^{c}} + p_{hi}^{s}(1-p_{hij}^{c})\frac{r_k^{st}}{p_{hi}^{s}} + p_{hij}^{c} p_{hi}^{s}\left(\frac{r_k^{ct}}{p_{hij}^{c}} + \frac{r_k^{st}}{p_{hi}^{s}}\right). \\ &= r_k^{ct} + r_k^{st} \end{aligned}$$

Note that, as required, this probability is the same as that for American Indian births in Group 1. The base weights for the Group 2 American Indian births are thus

$$w_{hijk}^{t} = \left[p_{hij}^{c}(1-p_{hi}^{s})\frac{r_k^{ct}}{p_{hij}^{c}} + p_{hi}^{s}(1-p_{hij}^{c})\frac{r_k^{st}}{p_{hi}^{s}} + p_{hij}^{c} p_{hi}^{s}\left(\frac{r_k^{ct}}{p_{hij}^{c}} + \frac{r_k^{st}}{p_{hi}^{s}}\right)\right]^{-1}.$$

2.8.3 Selection Probabilities for Substitute Primary Sampling Units and Alternative Frames

As described in chapter 4 of the *Nine-Month User's Manual*, substitute PSUs were used in place of the originally selected PSUs in some states. In a few cases, hospital sampling frames were used as alternatives to birth records provided by state registrars. The purpose of this section is to discuss the impact of these features on probabilities of selection. Special weighting adjustments for these situations are discussed in chapter 4 of this report.

Substitute cases from a substitute PSU were treated as if they were selected from the corresponding original PSU. This included assigning the PSU, SSU, and within-SSU selection probabilities that would have been appropriate for the original PSU to each case in the substitute PSU (or SSU). This was done at the case stratum level. The net result was that the overall selection probability for each case in a substitute PSU (or SSU) was assigned as if the case had been selected from the corresponding original PSU (or SSU).

Alternative sampling frames were used in a few PSUs where it was expected that such frames cover most of the births in the given jurisdiction. In these PSUs, sampling rates derived at the PSU (or SSU) level were used to meet the sampling targets for each of the 36 case strata.

2.8.4 Base Weights

The overall probability of selection for a given birth is computed as the product of each stage's probability of selection. For birth certificates sampled in PSU sampling stratum *h*, PSU *i*, SSU *j*, case stratum *k* at time *t*, the selection probability is

$$p_{k_t} = p_{hi}\, p_{hij}\, p_{hijk_t}.$$

Originally, the sample was designed to yield a constant overall probability of selection for births belonging to a given case stratum. Exceptions to this rule are due to sampling for the American Indian supplement and the sample reduction described in section 2.5.

The base weight gives the approximate representation of each sampled birth certificate. The base weight for a given birth record was calculated as the reciprocal of the overall probability of selection:

$$w_{k_t} = \frac{1}{p_{k_t}}.$$

The data weighting adjustments start with the base weights. The adjustments were for nonresponse and calibration to known population totals.

2.8.5 Adjustments for Substitution and Alternative Frames

An initial calibration adjustment was used for cases from substitute PSUs and PSUs where alternative frames were used in order to address differences in size between original and substitute PSUs and noncoverage from the alternative frames. In both instances, the expected sums of sample weights for each of the 36 case strata in the originally selected PSU were computed based on data from the 2001 NCHS birth data files for the PSU. The sample weights for the selected cases were then adjusted so that their sums by case strata matched the expected sums. This adjustment was the same for a given case included in each of the four sets of weights. Then these adjusted weights were further modified with the usual adjustments for nonresponse and undercoverage, cutting across PSUs.

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3. RESPONSE RATES

3.1 Introduction

3.1.1 Overview

This chapter reviews response rates for the 9-month data collection in the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), specifically, unit response rates at the primary sampling unit (PSU)/secondary sampling unit (SSU) level;[1] unit response rates for the parent interview, child assessments, and resident and nonresident father questionnaires; and item response rates in all ECLS-B data collection instruments for any items with response rates of 85 percent or less.

The target population for the ECLS-B, with minor exclusions, consists of children born in the United States in 2001. Children born to mothers under 15 years of age were excluded, as were infants who died or were known to have been adopted before the first round of data collection, which took place when the children were about 9 months of age. These exclusions were treated as ineligible, and thus those sampled were not classified as nonresponse. As described in chapter 2 of this report, the basic sample design was a three-stage design, with births being sampled within geographical areas from lists of 2001 births reported by state registrars to the National Center for Health Statistics.

The ECLS-B 9-month data collection included three main components—a parent component, a child component, and a father component. Generally speaking, a "nonrespondent" to a particular component is any sampled, eligible live birth for whom insufficient component data were collected. Thus, nonresponse can exist for parents, children, or fathers. In addition, there is some nonresponse at the PSU level to be considered. A full discussion of the components of data collection and definitions of completed cases for each component are given in section 3.2.

Nonresponse at the PSU level occurred because a few states were unwilling to allow their birth records to be used as a sampling frame for the ECLS-B, or would allow them to be used only under conditions that would yield very low response rates. A few states did not allow studies where birth certificates are sampled and the parents are contacted, while others would allow such a study only if the

[1] A PSU is an individual county or group of contiguous counties. An SSU is a subdivision of a PSU.

parents actively give permission for survey interviewers to contact them. It was possible to use hospital records as an alternative sampling frame in a few of the PSUs selected in these states, but in other cases the sampled PSUs were dropped from the survey and replaced by similar PSUs located in other states. (See sections 2.2 and 2.3 of this report for more detail on these issues.) When substitute PSUs were used, the sampled births in the original PSUs are treated as nonrespondents. When hospital frames were used as alternative frames the births are treated as respondents for survey components for which adequate data were obtained (see section 3.2).

Within participating PSUs, total nonresponse could result from a number of factors. Some persons could not be located; others were located but refused or were unavailable to participate. Sometimes persons were located but could not be contacted because interviewers could not enter the premises. Finally, some persons moved too far outside the sampled PSU to be interviewed. In these cases, the end result was that no data were obtained for a birth that had been sampled for the ECLS-B.

Nonresponse could occur for an entire sampled case, or for any one of the components. For example, a parent interview might be completed, but not the child assessments or the appropriate father questionnaire. Thus there are several stages of nonresponse: PSU nonresponse, total case nonresponse within PSUs (or SSUs), nonresponse for individual survey components, and item nonresponse within components. This chapter reviews response rates for all these stages, including response rates conditional on earlier stages and unconditional response rates.

3.1.2 Calculation of Response Rates

This report presents both unweighted and weighted response rates. Unweighted response rates reflect what actually happened in the field, while weighted response rates show the impact on the target population. Thus, for example, an unweighted response rate of 76.8 percent indicates that the operations staff were able to obtain data for 76.8 percent of the cases fielded. On the other hand, a weighted response rate of 74.1 percent shows that the data obtained from respondents represents 74.1 percent of the target population. Put another way, unweighted response rates can be useful in analyzing field operations, weighted response rates for assessing the impact on data analysis.

Unweighted response rates are calculated as the number of completed units divided by the number of cases in the eligible sample. This rule applies to PSUs/SSUs, the data collection instruments, or specific data items. The definitions of completed units for the parent, child, and father instruments are given in section 3.2. The ineligible cases that were excluded from the denominator in the response rate calculations consisted of cases (1) where the child was deceased;[2] (2) where the child was adopted before 9 months of age; and (3) where the child's mother was younger than 15. Originally sampled cases that were subsequently removed from the sample as part of a sample reduction in February 2002 were also excluded as ineligible.

Weighted response rates are computed in the same way as unweighted rates except that each sampled case is weighted by the inverse of the case's selection probability. Thus the weighted response rate is the sum of the sampling weights for respondents divided by the sum of the sampling weights for all eligible cases. Unweighted and weighted response rates can differ because of differences in response rates across the 36 birth certificate sampling strata, which have different selection probabilities and hence different sampling weights, and because of differences in response rates before and after sample reduction. The planned sample size was reduced during the course of data collection, which resulted in cases fielded earlier in the year having higher selection probabilities (and lower sampling weights) than those fielded later in the year. The weighted response rates incorporate adjustments for differences in selection probabilities between sampling strata and between cases selected before and after the sample reduction.

3.1.3 Conditional Versus Unconditional Response Rate Calculations

The "conditional" response rates are conditioned on completion of the parent component. Consider, for example, the parent-child conditional and unconditional response rates. The denominator for the conditional Parent-Child response rate includes only those cases that were Parent respondents, whereas the denominator for the unconditional Parent-Child response rates includes all eligible sampled cases. The numerator for both response rates includes those cases that were Parent-Child respondents. The Parent-Father conditional and unconditional response rates were calculated similarly.

[2] The highest mortality rate was among very low birth weight cases, where 26.4 percent of the sample was deceased by the time of the home visit. (This percentage includes a small but unknown number of adoptions, because some states did not distinguish between deaths and adoptions in reporting to the National Center for Health Statistics on sampled cases that should be considered ineligible. It does not include some deaths that were identified by states and removed from the list of births prior to sampling.) This experience was consistent with expectations; the sample design assumed a 26.0 percent mortality rate for very low birth weight children in the first 9 months of life, based on an analysis of birth and mortality files from prior years, and this assumption was incorporated in the sample selection rates.

The inclusion of substitute PSUs represents another stage of conditioning. As noted earlier, the ECLS-B 9-month sample included cases selected as substitutes for cases in PSUs where restrictions imposed by state registrars or institutional review boards made data collection infeasible. This chapter compares response rates "before" and "after" substitution to evaluate the impact of this stage of nonresponse. The "before substitution" response rates count all eligible cases from substitute PSUs as nonrespondents and thus are unconditional with respect to PSU nonresponse. The "after substitution" response rates count all eligible cases from substitute PSUs as either respondents or nonrespondents as appropriate given their dispositions.

3.2 Components and Definitions of a Completed Case

The 9-month data collection consisted of three main components:

1. Parent interviews (parent CAPI instrument and parent self-administered questionnaire);
2. Child assessments (the physical measurements, Bayley Short Form–Research Edition [BSF-R], Nursing Child Assessment Teaching Scale [NCATS]); and
3. Father questionnaires (self-administered resident and nonresident father questionnaires).

For the purpose of constructing the ECLS-B 9-month weights, a completed case was defined at the component level, as follows:

Parent-level complete. Cases where sections up to and including the child development (CD) section of the parent CAPI instrument were complete, i.e., the Introduction [IN], the Family Structure [FS], and the CD sections of the instrument. The count of items up to and including the CD section is 58, out of 160 minimum for the entire parent component, or about 36 percent of the parent items. There are 10,688 cases that meet this criterion.

Child-level complete. Cases where either the physical measurements, or BSF-R mental scale or motor scale sections were complete. There are 10,221 cases that meet this criterion. Table 21 presents the breakdown of the 10,688 9-month parent completes with respect to these child components.

Table 21. Parent-level completes, broken down by completed and missing BSF-R and physical measurements components, 9-month data collection: 2001–02

Bayley Short Form–Research Edition	Physical measurements	Number
Total		10,688
Complete	Complete	9,948
Complete	Missing	252
Missing	Complete	21
Missing	Missing	467

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Nine-Month Data Collection, 2001–02.

Father-level complete. Fathers of children sampled in the ECLS-B were surveyed using self-administered questionnaires. The resident father questionnaire was given to the partner of the person who completed the parent questionnaire, who was almost always the mother of the sampled child. The nonresident father questionnaire was given to the nonresident biological father of the child in cases where the mother identified such a person, where the father met the visit frequency criterion, and where the mother gave permission to contact him and provided contact information. The frequency criterion was that the nonresident father must have seen the child at least once in the previous month; or he must have seen the child at least 7 days in the previous 3 months; or he must have been in touch with the child's birth mother at least once a month in the 3 months preceding the parent interview. A child could have both a resident and a nonresident father.

Father-level completes were defined as cases with one or more responses on the resident father questionnaire (RFSAQ) only, the nonresident father questionnaire (NRFSAQ) only, or on both questionnaires if the child had both a resident and an eligible nonresident father, as appropriate for the case. Only a very small proportion of cases (less than 1 percent) required both resident father and nonresident father questionnaires. These cases are treated as father-level completes only if both components were completed, using the criterion given above. Altogether, there are 6,998 father-level completes. An additional 51 fathers were respondents to the parent interview. These fathers did not receive the father questionnaire; however, they answered similar items following special paths in the parent CAPI instrument and are counted as respondents to the father questionnaire.

3.3 Unit Response Rates

3.3.1 Response Rates for Primary or Secondary Sampling Units

Few surveys experience PSU or SSU nonresponse. However, the ECLS-B did encounter this problem. Policies in place in a few states made it infeasible in those states to obtain contact information from birth certificates in the PSUs selected for the ECLS-B sample. If no alternative sampling frame was available for sampling births in these PSUs, PSU nonresponse occurred. Furthermore, since some PSUs crossed state lines, there could be one or more nonresponding SSUs within a PSU.

To evaluate this stage of response, weighted response rates were computed for the core and American Indian supplemental sampling frames. The PSU selection probabilities were inverted to create PSU sampling weights. The weighted PSU response rate was calculated as the sum of PSU weights over sampled persons in responding PSUs divided by the sum of PSU weights over sampled persons in all sampled PSUs. In the core ECLS-B PSU sample, there were 8 nonrespondent PSU/SSUs among 121 selected PSU/SSUs; in the American Indian supplemental PSU sample, there was one nonrespondent PSU among 18 selected. The overall weighted response rate at the PSU/SSU level was 90.9 percent.

3.3.2 Conditional Response Rates for the Parent Interview

Table 22 gives the weighted and unweighted response rates for the parent interview in the 9-month data collection, conditional on PSU participation, meaning that cases completed in substitute PSUs are counted as respondents. Unconditional response rates are given in section 3.3.5. The overall weighted response rate was 74.1 percent. The 3,509 nonresponse cases were classified into three categories:

- "Unlocatable" signifies the case could not be found at the parent's residential address on the birth record, and attempts to determine a current address were unsuccessful;
- "Refusal" indicates that the case was found, but the parent did not agree to participate in the study; and
- "Other" represents all other reasons for nonresponse, of which the most common were language barriers, cases where families had moved too far to interview, and cases where families were out of the country.

Table 22. Final case status of the 9-month data collection, based on parent interview status: 2001–02

Status	Number of cases	Unweighted percent[1]	Weighted percent[1]
Total	13,921	100.0	100.0
Complete	10,688	76.8	74.1
Unlocatable	848	6.1	6.9
Refusal	1,943	14.0	16.0
Other	442	3.2	2.9

[1] The unweighted and weighted percents are based on completion of the parent interview. The parent interview is considered complete if the interview successfully passed through section CD (Child Development) of the parent CAPI instrument.
NOTE: The base weight was used (W1BASEWT). Detail may not sum to totals due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Nine-Month Data Collection, 2001–02.

The proportions of cases in these categories are given both unweighted and using the unadjusted sampling, or base, weights. Referring to weighted estimates, the proportion of unlocatable cases was 6.9 percent, the proportion of refusals was 16.0 percent, and the proportion for “other” nonresponse was 2.9 percent. These proportions reflect the target population of sampled births, with each twin in a twin-pair being counted separately.

Table 23 gives weighted and unweighted response rates for the parent interview by race/ethnicity, birth weight, plurality, census region, and mother’s education according to data recorded on the birth certificate. The weighted response rate varies from 63.2 percent to 79.7 percent by race/ethnicity category, a range of nearly 17 percentage points. The response rate for Chinese, at 63.2 percent, is substantially lower than the overall rate of 74.1 percent. While Chinese cases were not more difficult to locate (6.6 percent versus the overall rate of 6.9 percent), they had both higher refusal rates (19.9 percent versus 16.0 percent overall) and more “other” dispositions (10.4 percent versus 2.9 percent overall).[3] Many of the latter dispositions were related to language difficulties.

There is less variation over other characteristics: from 73.9 to 80.7 percent by plurality, from 68.4 to 76.5 percent by region, from 73.9 to 77.3 percent by birth weight, and from 73.6 to 74.9 percent by mother’s education. Thus the greatest variation in response is by race/ethnicity and the least by mother’s education, with moderate differences by plurality, region, and birth weight.

[3] The detailed data for Chinese case dispositions discussed in this paragraph are not shown in the tables presented in this report.

Table 23. Conditional response rates for the 9-month data collection for the parent interview: 2001–02

Characteristic	Number sampled	Response rates[1]	
		Unweighted percent	Weighted percent
Total	13,921	76.8	74.1
Race/ethnicity			
American Indian/Alaska Native	1,102	79.2	79.3
Chinese	732	63.7	63.2
Other Asian/Pacific Islander	1,832	73.4	70.1
Hispanic	2,084	75.9	72.3
Black, non-Hispanic	2,161	82.0	79.7
White, non-Hispanic	6,010	77.4	73.7
Birth weight (in grams)			
Very low (less than 1,500)	1,473	78.1	76.6
Moderately low ($\geq$ 1,500 and < 2,500)	2,055	80.1	77.3
Normal (2,500 or more)	10,393	75.9	73.9
Plurality			
Twin	2,023	82.0	80.7
Non-twin (single birth or other multiple births)	11,898	75.9	73.9
Census region of residence			
Northeast	2,270	72.5	68.4
Midwest	3,097	79.4	76.5
South	4,775	77.6	75.0
West	3,755	76.5	75.1
Outside the 50 states and the District of Columbia	24	25.0	20.9
Mother's highest grade			
Less than 4 years of high school	2,738	77.2	73.8
Four years of high school	4,217	76.9	73.6
Some college	2,864	77.3	74.8
Four or more years of college	3,782	75.8	74.4
Not classifiable	320	78.1	74.9

[1] All response rates are computed at the child level. The parent interview component rates are based on the entire eligible sample. The parent interview is considered complete if the interview successfully passed through section CD (Child Development) of the parent CAPI instrument.

NOTE: The base weight (W1BASEWT) was used to calculate response rates. Source of information for all child characteristics was the birth record. Race/ethnicity here represents the race/ethnicity of the child, as derived from the mother's race/ethnicity on the birth record (and the father's race/ethnicity on the birth record, for Chinese and American Indian or Alaska Native births). Detail may not sum to total due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Nine-Month Data Collection, 2001–02.

3.3.3 Conditional Response Rates for the Child Assessments and Father Questionnaires

Even when the parent interview was completed, one or more of the other study components—the child assessments, the resident father questionnaire, and the nonresident father questionnaire—might not be completed. All the response rates reported in this section were computed conditional on the completion of the parent interview, meaning that only completed parent interviews are included in the denominator.

Child assessments. The child assessment component included the Bayley Short Form–Research Edition (BSF-R), the Nursing Child Assessment Teaching Scale (NCATS), the physical measurements data, and the Child Observations. See *Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Methodology Report for the Nine-Month Data Collection, Volume 1: Psychometric Characteristic,* NCES 2005–1000 (Andreassen and Fletcher forthcoming) for more information about the child assessments. Completed child assessments were defined as cases with data for at least one of the BSF-R mental scales, the BSF-R motor scales, or complete physical measurements. These response rates are given in table 24 by race/ethnicity, birth weight, plurality, mother's education, and census region according to the birth certificate data and household poverty level and socioeconomic status determined from data collected in the parent interview. (Note: While six children are shown as having permanent residence outside the 50 states or District of Columbia, all assessments were done in the United States.)

The overall weighted response rate for the child assessments was 96.7 percent, conditional on a completed parent interview. Thus, among cases with completed parent interviews, only 3.3 percent of child assessments were not completed. Table 24 shows how little the child-level response rate (conditioned on the completed parent interviews) varies over sample domains and other characteristics. There is little variability by race/ethnicity (except for Chinese), birth weight, plurality, household socioeconomic status, household poverty level, and mother's education (except for the "not classified" group). All conditional response rates for the child assessments were high, with the lowest being 90.4 percent for "not classifiable" mother's education and 90.8 percent for Chinese. This lack of variation over sampling domains results in overall weighted and unweighted response rates that are identical to one decimal, since the primary source of variation in sampling weights is the differing sampling rates over the sampling domains.

Table 24. Conditional response rates for the 9-month data collection for the child assessments: 2001–02

Characteristic	Number sampled	Response rates[1] Unweighted percent	Weighted percent
Total	10,688	95.6	95.6
Race/ethnicity			
American Indian/Alaska Native	873	95.6	95.6
Chinese	466	89.7	90.8
Other Asian/Pacific Islander	1,345	95.7	95.5
Hispanic	1,581	94.9	94.6
Black, non-Hispanic	1,771	96.8	96.8
White, non-Hispanic	4,652	96.0	95.6
Birth weight (in grams)			
Very low (less than 1,500)	1,151	95.0	94.6
Moderately low (≥ 1,500 and < 2,500)	1,647	96.2	96.0
Normal (2,500 or more)	7,890	95.6	95.6
Plurality			
Twin	1,658	95.6	95.5
Non-twin (single birth or other multiple births)	9,030	95.6	95.6
Household poverty level			
Less than 100 percent of poverty	2,603	95.7	95.5
100–149 percent of poverty	1,633	95.3	95.3
150–199 percent of poverty	1,735	95.6	95.7
200 percent or more of poverty	4,717	95.7	95.6

See notes at end of table.

Table 24. Conditional response rates for the 9-month data collection for the child assessments: 2001–02—Continued

Characteristic	Number sampled	Child assessments: Response rates[1] Unweighted percent	Weighted percent
Household socioeconomic status (SES) quintile			
1 – lowest	2,110	95.1	94.9
2	2,141	96.0	96.0
3	2,086	95.9	95.8
4	1,986	95.5	95.8
5 – highest	2,365	95.7	95.3
Census region of residence			
Northeast	1,646	93.4	93.0
Midwest	2,460	97.5	97.7
South	3,705	96.5	96.4
West	2,871	94.1	94.0
Outside the 50 states and the District of Columbia[2]	6	100.0	100.0
Mother's highest grade			
Less than 4 years of high school	2,115	95.8	95.2
Four years of high school	3,241	95.8	96.0
Some college	2,214	95.4	95.3
Four or more years of college	2,868	95.6	95.9
Not classifiable	250	93.2	90.4

[1] All response rates are computed at the child level. The child assessment response rates are conditioned on completing the parent interview.

[2] While six children are shown as having permanent residence outside the 50 states or District of Columbia, all interviews were done in the United States.

NOTE: The base weight (W1BASEWT) was used. Source of information for all child characteristics, except poverty level, was the birth record. SES was calculated as described in section 7.5.2.7 in the ECLS-B 9 month user's manual. Poverty level was determined using data on household income and household size obtained during the parent interview. This information was compared to the U.S. Bureau of the Census' weighted poverty thresholds for 2001 for households with children. For example, a household was defined as being at less than 100 percent of poverty if the household income was below the poverty threshold for a family of that size.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Nine-Month Data Collection, 2001–02.

Resident and nonresident father questionnaires. The determination of eligible fathers was contingent on a number of steps, which are described in table 25. The table shows the number of cases that passed through each stage of father identification and questionnaire completion. In the parent questionnaire, respondents were asked to indicate whether the child had a resident and/or nonresident father. In 8,344 cases, children were identified as having a resident father; these fathers were identified as spouses or partners currently living in the child's household with the parent. Similarly, 2,238 children were identified as having eligible nonresident fathers, defined as biological fathers who were not currently living in the child's household and met the contact frequency and permission requirements discussed earlier.

Table 25. Stages in identifying and completing father questionnaires, by father type, 9-month data collection: 2001–02

Stage	Number of cases[1]	Unweighted percent[2]	Weighted percent[2]
Total	10,688	100.0	100.0
Children with no father identified	120	1.1	†
Resident father questionnaire			
Children identified with resident fathers	8,344	100.0	100.0
Completed questionnaires	6,270	75.1	76.1
Nonresident father questionnaire			
Children identified with nonresident fathers	2,238	100.0	100.0
Children with nonresident fathers who met the contact frequency eligibility criteria	1,778	79.4	78.4
Children whose mother provided information to contact father	1,326	74.6	74.5
Completed questionnaires	679	51.2	50.0

† Not applicable (there are no weights for this group, and thus no weighted percent).
[1]A child could have both resident and nonresident fathers. As a result, the numbers of resident and nonresident fathers does not sum to the total.
[2]All response rates are computed at the child level. The resident father questionnaire and the nonresident father questionnaires are conditioned on completing the parent interview.
NOTE: The base weight (W1BASEWT) was used. Sources of information for stages in identifying and completing father questionnaire were parent interview and father questionnaires.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort, (ECLS-B), Nine-Month Data Collection, 2001–02.

Thus, the requirements for eligibility for the father questionnaires included (1) being identified as a resident or nonresident, (2) meeting the required frequency criterion for nonresident fathers, (3) being permitted contact by the mother for nonresident fathers, and (4) being alive at the time of the interview.

For 120 completed parent interviews, no father was identified. In 75 of these cases, the father resided in the household but was not identified as the spouse/partner of the respondent. In 14 of these 75 cases, the father was the respondent and thus not identified as a respondent for the resident father questionnaire. Another 11 cases resulted from interviews with grandparents or other nonparent guardians, who had no spouse/partner and who were not asked to identify the biological father. Finally, in 32 cases, the biological father was deceased and there was no spouse/partner, leaving two cases that are unaccounted for.

Altogether, 51 fathers were respondents to the parent interview. As noted above, 14 of these 51 were respondents and thus not identified as respondents for the resident father questionnaire. Among the remaining 37, 24 were respondents to the resident father questionnaire; 13 were nonrespondents to the resident father questionnaire. Regardless of whether these fathers completed the resident father questionnaire; however, they answered similar items following special paths in the parent CAPI instrument. As a result, these 51 fathers are counted as respondents to the father questionnaire in tables 26, 27, and 30.

Note that the father and nonresident father types are not mutually exclusive. Both resident and nonresident fathers were identified for 14 children. Thus the number of children identified without fathers plus the number of resident and nonresident fathers in table 25 does not sum to the total number of children.

Table 26 provides the final case status of the father questionnaires. For each father type, the final outcomes (completed, unlocatable, refused, or other nonresponse) are shown for all eligible cases. Data on fathers were obtained on 49.8 percent of all children sampled for ECLS-B; the weighted estimate for the population of children for whom data on fathers were obtained is 44.9 percent (this value is not shown in the tables but was calculated by the number of children with either resident or nonresident fathers by the total children sampled). This weighted percentage is higher for White and American Indian/Alaska Native children (50.4 and 45.4 percent, respectively) and lower for Black, Hispanic,

Table 26. Final case status of the father questionnaires, by father type, 9-month data collection: 2001-02

Father type and status	Number sampled	Unweighted percent[1]	Weighted percent[1]
Resident father questionnaire			
Total	8,344	100.0	100.0
Complete	6,270	75.1	76.1
Unlocatable	22	0.3	0.3
Refusal	161	1.9	1.8
Other	1,891	22.7	21.9
Language barrier	51	0.6	0.4
Never receipted	1,167	14.0	13.2
Stopped work, some components completed	264	3.2	3.5
Other	409	4.9	4.8
Nonresident father questionnaire			
Total	1,326	100.0	100.0
Complete	679	51.2	50.0
Unlocatable	42	3.2	2.7
Refusal	88	6.6	6.3
Other	517	39.0	41.0
Language barrier	3	0.2	0.2
Never receipted	282	21.3	21.4
Stopped work, some components completed	88	6.6	8.1
Other	144	10.9	11.2

[1] All response rates are computed at the child level. The resident father questionnaire and nonresident father questionnaire are conditioned on completing the parent interview. The parent interview is considered complete if the interview successfully passed through section CD (Child Development) of the parent CAPI instrument.
NOTE: The base weight (W1BASEWT) was used. Source of information for father status was the field management and receipt control system.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort,(ECLS-B), Nine-Month Data Collection, 2001–02.

Chinese, and Other Asian/Pacific Islander children (31.2, 39.6, 42.3, and 42.6 percent, respectively). These estimates are not shown in tables in this report. They were calculated by dividing the number of children with either completed resident or nonresident father questionnaires by the total number of children sampled.

Table 27 gives conditional response rates for the resident and nonresident father questionnaires for different population subgroups. These response rates are conditioned on the completion of the parent interview. For resident fathers, the response rate was based on the identification of a spouse

Table 27. Conditional response rates for the 9-month data collection, by resident father questionnaire, nonresident father questionnaire, and all fathers: 2001–02

Characteristic	Resident father questionnaire			Nonresident father questionnaire			All fathers[2,3]		
		Response rates[1]			Response rates			Response rates	
	Number sampled	Unweighted percent	Weighted percent	Number sampled	Unweighted percent	Weighted percent	Number sampled	Unweighted percent	Weighted percent
Total	8,349	75.1	76.1	1,326	51.2	50.0	9,662	71.8	72.6
Race/ethnicity									
American Indian/Alaska Native	647	72.6	71.7	134	61.2	62.1	777	70.5	69.8
Chinese	457	75.9	75.8	‡	‡	‡	459	75.8	75.7
Other Asian/Pacific Islander	1,182	70.5	70.2	87	49.4	49.0	1,266	69.2	68.9
Hispanic	1,260	67.3	66.1	153	44.4	44.1	1,407	64.9	63.9
Black	736	62.6	62.0	676	51.9	51.5	1,408	57.6	56.9
White	4,063	81.5	81.5	283	47.3	48.7	4,339	79.3	79.3
Birth weight (in grams)									
Very low (less than 1,500)	828	74.3	73.3	175	50.3	50.0	1,000	70.1	69.2
Moderately low (≥ 1,500 and < 2,500)	1,228	75.1	73.6	234	45.7	48.2	1,453	70.6	69.2
Normal (2,500 or more)	6,286	75.3	76.3	927	52.2	49.8	7,206	72.3	72.8
Plurality									
Twin	1,345	78.2	77.4	177	43.5	43.8	1,520	74.3	73.7
Non-twin (single birth or other multiple births)	6,995	74.6	76.0	1,160	51.9	49.8	8,134	71.4	72.5
Household poverty level									
Less than 100 percent of poverty	4,418	67.0	67.3	156	52.4	50.5	2,079	62.0	61.7
100–149 percent of poverty	1,366	67.2	66.5	721	51.0	49.1	1,411	64.2	63.4
150–199 percent of poverty	1,153	74.6	75.7	263	49.2	49.5	1,594	71.7	72.7
200 percent or more of poverty	1,408	79.9	81.3	193	45.3	47.4	4,567	78.8	80.0

See notes at end of table.

Table 27. Conditional response rates for the 9-month data collection, by resident father questionnaire, nonresident father questionnaire, and all fathers: 2001–02—Continued

Characteristic	Resident father questionnaire			Nonresident father questionnaire			All fathers[2,3]		
		Response rates[1]			Response rates			Response rates	
	Number sampled	Unweighted percent	Weighted percent	Number sampled	Unweighted percent	Weighted percent	Number sampled	Unweighted percent	Weighted percent
Household socioeconomic status (SES) quintile									
1 – lowest	1,122	61.7	62.2	554	53.1	48.3	1,671	58.9	57.9
2	1,530	68.9	69.5	364	47.8	50.5	1,883	65.0	66.1
3	1,643	73.1	73.0	269	52.0	52.2	1,905	70.2	70.3
4	1,779	80.5	82.8	112	50.0	50.9	1,889	78.7	81.0
5 – highest	2,270	83.3	85.8	38	39.5	42.5	2,315	82.3	84.8
Census region of residence									
Northeast	1,314	76.2	74.5	176	44.3	45.1	1,487	72.5	71.1
Midwest	1,932	81.3	83.2	306	48.4	47.0	2,225	76.8	78.6
South	2,711	75.9	77.0	621	55.6	54.4	3,328	72.2	73.1
West	2,378	68.7	69.0	235	46.0	42.9	2,610	66.7	66.7
Outside the 50 states and the District of Columbia	6	100.0	100.0	‡	‡	‡	6	100.0	100.0
Mother’s highest grade									
Less than 4 years of high school	180	67.0	67.3	450	50.2	49.6	1,759	62.6	63.0
Four years of high school	1,310	70.6	71.7	563	52.4	50.9	2,845	67.1	67.8
Some college	2,293	78.4	78.5	221	47.5	47.2	2,043	75.2	75.5
Four or more years of college	1,827	81.5	83.9	52	59.2	50.4	2,798	80.8	83.1
Not classifiable	2,739	62.6	62.0	37	59.5	51.9	210	61.9	59.6

‡ Reporting standards not met.
[1] All response rates are computed at the child level. The resident father questionnaire and the nonresident father questionnaire are conditioned on completing the parent interview. Response rates for the resident father and nonresident father questionnaires do not add to the response rates for all fathers, because a case could have both questionnaires completed. The weights were developed for all fathers; cases eligible for both questionnaires have a positive weight only if both were completed for the case.
[2] Includes both resident and nonresident fathers. A child could have a resident father, a nonresident father, both, or neither. Children with both father types are counted as having unit response if both father questionnaires were complete.
[3] The 51 resident fathers who completed the parent interview are tabulated as respondents to the parent interview and not included in this table.
NOTE: The base weight (W1BASEWT) was used. Source of information for household poverty level and SES quintile was the parent interview. Poverty level was determined using data on household income and household size obtained during the parent interview. This information was compared to the U..S. Bureau of the Census’ weighted poverty thresholds for 2001 for households with children. For example, a household was defined as being at 100 percent of poverty if their household income was below the poverty threshold for a family of that size. Source of information for all other child characteristics was the birth record. Race/ethnicity here represents the race/ethnicity of the child, as derived from the mother’s race/ethnicity on the birth record (and the father’s race/ethnicity on the birth record, for Chinese and American Indian or Alaska Native births). Detail may not sum to totals due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

or partner of the parent respondent who was living in the same household and was 76.1 percent (weighted), this being the weighted number of resident father questionnaires received divided by the weighted number of eligible resident fathers.

The response rate for the nonresident father questionnaire is conditioned on the completion of the parent interview, based on (1) the identification of a nonresident biological father by the mother in the parent CAPI instrument, (2) his meeting the criteria for frequency of recent contacts with either mother or child, and (3) the mother's consent to his participation in the study. This response rate was 50.0 percent (weighted), the weighted number of completed nonresident father questionnaires received divided by the weighted number of eligible nonresident fathers.

Table 27 also shows how resident and nonresident father response rates vary by household characteristics. For resident fathers, the weighted response rates range from a low of 62.0 percent to a high of 85.8 percent. This response rate varies by race (low of 62.0 percent for Blacks versus 81.5 percent for Whites); mother's education (62.0 percent for "unclassifiable" versus 83.9 percent with 4 or more years of college); poverty status (about 67 percent below 150 percent of poverty versus 81.3 percent for 200 percent or more of poverty); SES (62.2 percent for the lowest SES quintile versus 85.8 percent for the highest), and region (69 percent in the West versus 83.2 percent in the Midwest). The patterns for the nonresident father questionnaire are less pronounced. Nonresident fathers response rates vary by race (44.1 percent for Hispanic to 62.1 percent to American Indian/Alaska Native), region (42.9 percent for the West versus 54.4 percent for the South), and SES (42.5 percent for the highest quintile versus 52.2 percent for the middle quintile). Thus, for nonresident fathers there are fewer variables with large variation, but the differences are a subset of those for resident fathers.

3.3.4 Unconditional Response Rates

The response rates considered in sections 3.3.2 and 3.3.3 were conditional on response at prior stages. This section discusses unconditional response rates.

Due to the policies of some states regarding use of birth certificates, substitute PSUs were identified to replace the PSUs initially selected for the ECLS-B. As discussed in section 2.3, substitute PSUs were selected to be as similar as possible to their corresponding "original" PSUs, based on geographic location, size, degree of urbanicity, median income, and other factors. Furthermore, in the process of sampling, considerable effort was taken to match sampled births to the births that would have been sampled from the original PSU by sampling strata. In raking, the sampling weights of cases in substitute PSUs were forced to match weighted totals in the original PSUs for a number of characteristics (see section 2.3 for discussion). Nonetheless, despite these efforts, differences could exist between the substitute PSUs and the original PSUs they were chosen to represent.

To evaluate the potential effects of these differences, this section presents response rates with and without substitute PSUs. In the former, respondents in substitute PSUs are counted in the numerator of the response rate along with respondents from originally selected PSUs; in this case, the denominator consists of eligible cases sampled in substitute PSUs and original PSUs in which birth certificates or hospital data were used to sample births and to obtain contact information. Response rates with substitute PSUs are identical to the response rates given in table 24. For response rates without substitute PSUs, the numerator consists of respondents in originally sampled PSUs and the denominator consists of all eligible cases sampled in both the participating original PSUs and the substitute PSUs.

The child assessments and father questionnaires are completed only if the parent responds. Thus, the unconditional child and father response rates are dependent on both the PSU response rate and the parent response rate.

Unconditional parent response rates. Table 28 gives the unconditional response rate for the parent interview by sampling race/ethnicity, birth weight, plurality, region, and mother's education using the four methods of weighting described above. Since the parent response rate before substitution classifies all parents in the original PSUs as nonrespondents, whereas the rate after substitution treats parent respondents in substituted PSUs as respondents, the response rates are substantially higher when the substitute PSUs are included. Overall, the weighted response rate drops from 74.1 percent with the substitute PSUs to 67.9 percent without them. This drop is somewhat greater than might be expected from the overall PSU/SSU response rate of 95.3 percent; however, several of the nonresponding PSUs were among the largest certainty PSUs, accounting for the disproportionate drop in the unconditional response rate. In any case, the reduction of about 6 percent appears to affect most demographic groups proportionately. One exception would be non-Hispanic Blacks, where the response rate drops by 10.7 percent when substitute PSUs are counted as nonresponse. This drop for non-Hispanic Blacks is due to the fact that the two largest nonresponding PSUs have large Black populations. That part of the sample was replaced in the substitution process.

Table 28. Unconditional parent response rates by child characteristics, in percent, 9-month data collection: 2001–02

Characteristic	Number sampled	Unweighted, after substitution	Weighted, after substitution	Unweighted, before substitution	Weighted, before substitution
Total	13,921	76.8	74.1	71.4	67.9
Race/ethnicity					
American Indian/Alaska Native	1,102	79.2	79.3	74.2	75.9
Chinese	732	63.7	63.2	60.5	57.7
Other Asian/Pacific Islander	1,832	73.4	70.1	68.1	65.9
Hispanic	2,084	75.9	72.3	72.6	69.3
Black, non-Hispanic	2,161	82.0	79.7	72.4	69.0
White, non-Hispanic	6,010	77.4	73.7	72.5	67.3
Birth weight (grams)					
Very low (less than 1,500)	1,473	78.1	76.6	73.0	71.3
Moderately low (≥ 1,500 and < 2,500)	2,055	80.1	77.3	74.8	71.7
Normal (2,500 or more)	10,393	75.9	73.9	70.5	67.6
Plurality					
Twin	2,023	82.0	80.7	76.5	74.0
Non-twin (single birth and other multiple births)	11,898	75.9	73.9	70.5	67.7
Census region of residence					
Northeast	2,270	72.5	68.4	55.6	49.1
Midwest	3,097	79.4	76.5	78.6	76.4
South	4,775	77.6	75.0	70.2	67.0
West	3,755	76.5	75.1	76.5	75.1
Outside the 50 states and the District of Columbia[1]	24	25.0	20.9	25.0	20.9
Mother's highest grade					
Less than 4 years of high school	2,738	77.2	74.0	71.8	69.2
Four years of high school	4,217	76.9	73.6	71.8	67.4
Some college	2,864	77.3	74.8	70.5	67.4
Four or more years of college	3,782	75.8	74.4	71.0	68.8
Not classifiable	320	78.1	78.3	71.3	62.3

[1] While six children are shown as having permanent residence outside the 50 states or District of Columbia, all interviews were done in the United States.

NOTE: Source of information for all child characteristics was the birth record. Race/ethnicity here represents the race/ethnicity of the child, as derived from the mother's race/ethnicity on the birth record (and the father's race/ethnicity on the birth record, for Chinese and American Indian or Alaska Native births).

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Nine-Month Data Collection, 2001–02.

Unconditional child response rates. Table 29 gives the unconditional response rates for the child assessments. The weighted, unconditional response rate for the child assessments is 70.9 percent with PSU substitution and drops to 65.0 percent without it, a decrease of 5.9 percent. The difference between response rates before and after substitution is similar across race/ethnic domains except for non-Hispanic Blacks, who show a decrease of 10.5 percent, reflecting the difference observed earlier for the parent questionnaire. Differences between response rates are similar by both birth weight and plurality.

Unconditional father response rates. Because of the large number of ineligible cases for both resident and nonresident fathers, the response rate calculations were modified slightly for these cases. The resident father questionnaire was given to the partner of the person who completed the parent questionnaire. The nonresident father questionnaire was given to the nonresident biological father of the child in cases where the mother identified such a person, where the father met the visit frequency criterion, and where the mother gave permission to contact him and provided contact information. Cases were considered ineligible when there was no identified partner to receive the resident father questionnaire and no identified, eligible nonresident father to receive the nonresident father questionnaire. For nonrespondents to the parent interview, it is unknown whether a father would have been identified or not.

The formula used to calculate response rates for the father questionnaire was the following:

$$\text{Response rate} = \frac{\sum_{i\in R} w_i}{\sum_{i\in R} w_i + \sum_{i\in NR} w_i + \left(\dfrac{\sum_{i\in R} w_i}{\sum_{i\in R} w_i + \sum_{i\in I} w_i}\right)\left(\sum_{i\in NR^*} w_i\right)}$$

where R denotes the set of respondents, NR the set of nonrespondents, I the set of ineligibles, and NR^* the set of nonrespondents whose eligibility is unknown for reasons given above.

Table 30 gives the unconditional response rates for the combined resident and nonresident father questionnaires. The weighted, unconditional response rate for all father questionnaires is 54.3 percent with PSU substitution and drops to 50.0 percent without it, a decrease of about 4.3 percent. This difference does not vary substantially by race/ethnicity, birth weight, or plurality. However, there is a marked impact by region, due to the location of substitute PSUs.

Table 29. Unconditional child response rates by child characteristics, in percent, 9-month data collection: 2001–02

Characteristic	Number sampled	Unweighted, after substitution	Weighted, after substitution	Unweighted, before substitution	Weighted, before substitution
Total	13,921	73.4	70.9	68.3	65.0
Race/ethnicity					
American Indian/Alaska Native	1,102	75.8	75.8	70.9	72.5
Chinese	732	57.1	57.4	54.4	52.7
Other Asian/Pacific Islander	1,832	70.3	66.9	65.1	62.9
Hispanic	2,084	72.0	68.4	69.0	65.7
Black, non-Hispanic	2,161	79.4	77.2	70.1	66.7
White, non-Hispanic	6,010	74.3	70.4	69.6	64.4
Birth weight[1] (grams)					
Very low (less than 1,500)	1,473	74.2	72.4	69.4	67.5
Moderately low ($\geq$ 1,500 and < 2,500)	2,055	77.1	74.2	72.0	68.9
Normal (2,500 or more)	10,393	72.6	70.6	67.4	64.7
Plurality					
Twin	2,023	78.3	77.2	73.1	70.7
Non-twin (single birth or other multiple births)	11,898	72.6	70.7	67.5	64.8
Census region of residence					
Northeast	2,270	67.8	63.7	51.9	45.9
Midwest	3,097	77.5	74.7	76.7	74.6
South	4,775	74.9	72.3	67.7	64.5
West	3,755	71.9	70.5	71.9	70.5
Outside the 50 states and the District of Columbia[1]	24	25.0	20.9	25.0	20.9
Mother's highest grade					
Less than 4 years of high school	2,738	74.0	70.5	68.8	69.2
Four years of high school	4,217	76.9	73.6	71.8	67.4
Some college	2,864	77.3	74.8	70.5	67.4
Four or more years of college	3,782	75.8	74.4	71.0	68.8
Not classifiable	320	72.8	71.5	66.3	62.3

[1] While six children are shown as having permanent residence outside the 50 states or District of Columbia, all assessments were done in the United States.

NOTE: Source of information for all child characteristics was the birth record. Race/ethnicity here represents the race/ethnicity of the child, as derived from the mother's race/ethnicity on the birth record (and the father's race/ethnicity on the birth record, for Chinese and American Indian or Alaska Native births).

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Nine-Month Data Collection, 2001–02.

Table 30. Unconditional father response rates by child characteristics, in percent, 9-month data collection: 2001–02

Characteristic	Number eligible[1]	Unweighted, after substitution	Weighted, after substitution	Unweighted, before substitution	Weighted, before substitution
Total	12,470	55.6	54.3	51.7	50.0
Race/ethnicity					
American Indian/Alaska Native	972	56.4	56.0	51.1	51.9
Chinese	720	48.3	47.9	45.6	43.1
Other Asian/Pacific Islander	1,713	51.1	48.7	47.4	45.8
Hispanic	1,828	49.9	46.9	47.5	44.7
Black, non-Hispanic	1,677	48.3	46.6	42.4	40.4
White, non-Hispanic	5,585	61.6	58.7	57.9	54.1
Birth weight					
Very low (less than 1,500)	1,265	55.4	53.7	51.3	49.6
Moderately low (≥ 1,500 and < 2,500)	1,797	57.1	54.2	53.8	50.7
Normal (2,500 or more)	9,413	55.3	54.3	51.3	50.0
Plurality					
Twin	1,844	61.2	59.8	57.0	54.3
Non-twin (single birth and other multiple births)	10,623	54.7	54.1	50.8	49.9
Census region of residence					
Northeast	2,029	53.1	49.3	41.1	35.8
Midwest	2,785	61.4	60.5	60.7	60.4
South	4,256	56.5	55.3	51.2	49.9
West	3,377	51.5	50.6	51.5	50.6
Outside the 50 states and District of Columbia	24	25.0	20.9	25.0	20.9
Mother's highest grade					
Less than 4 years of high school	2,231	49.3	47.6	45.9	44.5
Four years of high school	3,655	52.2	50.6	48.9	46.7
Some college	2,628	58.5	56.8	53.3	51.5
Four or more years of college	3,686	61.3	61.9	57.5	57.1
Not classifiable	265	49.1	45.9	44.5	41.5

[1] The number eligible were estimated as shown in the formula on p. 94.

NOTE: Source of information for all child characteristics was the birth record. Race/ethnicity here represents the race/ethnicity of the child, as derived from the mother's race/ethnicity on the birth record (and the father's race/ethnicity on the birth record, for Chinese and American Indian or Alaska Native births. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection: 2001–02.

The unconditional weighted resident father response rate was 57.6 percent after substitution and 53.3 percent before substitution. Weighted unconditional response rates for nonresident fathers were 41.9 percent after substitution and 38.4 percent before substitution. Because of the high conditional response rate on the child assessment, the unconditional father-child response rates, which are not shown in this table, were nearly identical to the overall father response rates, both before and after substitution.

3.4 Item Response Rates

In keeping with National Center for Education Statistics (NCES) statistical standards, this section reviews item response rates, listing key variables for cross-tabulations and variables from the parent questionnaire, child assessment, and father questionnaires with unweighted item response rates less than 85 percent. These response rates were computed excluding cases where the item was not applicable (e.g., only parents indicating that the child received care from a relative were asked detailed questions about relative care, such as location or frequency of care).

Table 31 gives item response rates for key variables that appear as demographic “stubs” in standard NCES tables. These variables include child’s sex, race/ethnicity, twin status, and birth weight, as well as mother’s and father’s education, whether the household is in poverty, and which parents live in the household. All variables are composites (see section 7.5 of the *Nine-Month User’s Manual* for a discussion of how these were created). The table gives the variable name, a description of the item, the number of cases with valid responses, the total number of eligible cases (i.e., cases that should have provided data for the item). As this table shows, the item response rates for all these variables are above 90 percent.

Table 32 provides item response rates for analytical variables on the restricted-use file that have response rates below 85 percent. However, certain types of items with item response rates below 85 percent are excluded from this table. For example, the table excludes 31 items that have fewer than 100 eligible respondents. One such item is the variable P1KYHH3, which records the language of the third adult in the household when that language is other than English; P1KYHH3 has an item response rate of 78.6 percent; however, only 14 cases had a third adult who spoke another language. Similarly, P1CHROTH, hours per week spent at “other” type of child care, has an item response rate of 55.6 percent, but only 18 eligible respondents.

Table 31. Item response rates for key variables, 9-month data collection: 2001–02

Variable name	Item description	Cases with valid responses[1]	Eligible cases	Item response rate[2] (percent)
X1CHSEX	Child's sex	10,688	10,688	100.0
X1CHRACE	Child's race/ethnicity	10,649	10,688	99.6
X1BTHWGT	Child's birth weight	10,646	10,688	99.6
X1MOMED	Mother's education	10,580	10,619[3]	99.6
X1FTHED	Father's education	8,313	8,427[4]	98.7
X1HPARNT	Parents who reside in the household	10,688	10,688	100.0
X1POVRTY	Household in poverty?	9,738	10,688[5]	91.1
X1TWSAMP	Child sampled as a twin?	10,688	10,688	100.0

[1]Excludes imputed data.
[2] This column shows the response rate prior to item imputation.
[3] 39 cases imputed.
[4] 114 cases imputed.
[5] 950 cases imputed.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Nine-Month Data Collection: 2001–02.

Table 32. Item response rates for items with response rates below 85 percent, 9-month data collection: 2001–02

Variable name	Item description	Cases with valid responses	Eligible cases	Item response rate (percent)
X1NCATTS	Total NCATS score	8,633	10,688	80.8
X1NCATTP	Parent NCATS score	8,633	10,688	80.8
X1NCATTC	Child NCATS score	8,631	10,688	80.8
X1CHCRFM[1]	Head circumference	991	1,197	82.8
X1MOMSCR	Occupational prestige score	5,289	6,238	84.8
X1NRFED[2]	Nonresident father's education	2,009	2,381	84.4
P1AGEBF	Age of respondent's biodad	6,487	8,819	73.6
P1NUMCHO	Number of biological children outside household	462	698	66.2
P1CHSUPT	Pay child support for these children?	582	698	83.4
P1WTABBY	Did you (mother) want another baby before you became pregnant?	799	954	83.8

[1] Head circumference was measured only on children who were born with very low birth weight.
[2] This item is a composite data and thus not limited to the number of completed nonresident father questionnaires.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection: 2001–02.

Most of the items excluded from table 32 resulted from fathers responding to the parent interview and answering items taken from the resident father questionnaire (e.g., P1STTR: "How often do you (Dad) pick child up from sitter/day care center?"). Such items are answered by most fathers in the questionnaire and are missing if the mother answered the parent CAPI instrument. It is unlikely that an analyst would use these data alone, since these respondents would be grouped with other fathers for some analyses and with parent questionnaires for others. In any case, items with only 100 eligible respondents would have sample sizes too small for most analyses and thus present no risk of bias.

In addition, table 32 excludes items that are not the primary source for providing data on a particular question. In some cases, these data resulted from a series of questions designed to obtain information from reluctant respondents. An example of this is the variable P1HMVL50 (home value > $50,000), which was asked only of respondents who failed to respond to P1HMVLU (present home value). Since P1HMVL50 was asked only of reluctant respondents, it naturally had a low response rate; however, it would be analyzed in combination with P1HMVLU, which had a response rate over 85 percent. A similar example would be P1BFDIPL (Does biological father have HS diploma?) and P1BFEDUC (biological father's education). Another type of example would be P1HHINCY (household income); rather than analyze P1HHINCY, an analyst would use the composite variable X1INCOME, which has a response rate above 85 percent.

The items of most concern in table 32 are the NCATS scores, all of which have response rates of about 81 percent, and nonresident father's education, although the latter has an item response only slightly below the 85 percent cutoff. There were a number of reasons for the 80.8 percent response rate in the NCATS scores. In 12 percent of the cases, parents refused to allow their children to be videotaped. In addition, the tables could not be coded for another 7.1 percent of the tapes, in part because of the parent spoke a language for which no interpreter could be found (0.3 percent), but more often because the tape quality was poor due to inadequate lighting. (See the *Nine-Month User's Manual* and *Volume 1: Psychometric Characteristics* of this report for more discussion.) The reasons for low item response rates for nonresident fathers are unclear.

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4. DATA WEIGHTING PROCEDURES

4.1 Background

This chapter describes the ECLS-B 9-month data weighting procedures. The 9-month weights are cross-sectional only, since the 9-month data collection was the first of several planned rounds of data collection. In the analysis of complex survey data, weights are used to adjust for unequal probabilities of selection, survey nonresponse, and noncoverage of the target population. The weights are designed to eliminate or reduce biases that would occur with unweighted analyses. The ECLS-B weights were developed in three steps:

1. Base weights were calculated for sampled births as the inverses of the overall selection probabilities (see section 2.8.4 of this report);

2. Base weights were adjusted to compensate for survey nonresponse; and

3. Raking was used mainly to improve the precision of survey estimates and further adjust for nonresponse.

The 9-month data weighting was complicated by the fact that there were three main 9-month survey components (the parent interview, the child assessments, and the father questionnaires [one each for resident and nonresident fathers]) that could be completed in various combinations, and many possible sets of weights could result. Section 4.2 describes these component combinations and presents the four sets of weights created for the ECLS-B 9-month data. Section 4.3 describes the general procedures used in making the weight adjustments. Section 4.4 describes the nonresponse adjustments applied to each set of weights. Section 4.5 describes the population raking adjustments, and section 4.6 presents characteristics of the weights.

4.2 Components, Combinations of Components, and Sets of Weights

As noted earlier, the 9-month data collection consisted of three main components: the parent interview, the child assessments, and the father questionnaires. See section 3.2 for a description of these components. These three main components could be completed in various combinations at the case level (i.e., sampled birth), resulting in a maximum of seven possible combinations and associated weights. The seven possible sets of weights could involve data from the following:

1. The parent interview only;

2. The child assessments only;

3. The father questionnaire only;

4. The parent interview and the child assessments only;

5. The parent interview and the father questionnaire only;

6. The father questionnaire and the child assessments only; or

7. The parent interview, the child assessments, and the father questionnaire.

In principle, a separate set of weights is appropriate for a given set of measures if the set of measures is of analytic interest and if there is an acceptable level of response for the set. A different set of weights should be constructed for each possible type of analysis if the aim is to maximize the sample size available for every analysis. However, such a proliferation of weights (and the associated replicate weights) is unwieldy and impractical for analysts. Therefore, the number of sets of weights was restricted to four, choosing combinations that are of analytic interest and that limit the loss in component data from not covering all combinations.

Table 33 shows, for the 9-month data collection, that the largest group of cases provided all three components. The next two largest categories are cases that provided the parent and child components, but not the father component, followed by cases that provided none of the three components. A small number of cases provided the parent component only, or the parent and father components without the child component. Note that the ECLS-B field procedures, properly followed, precluded initiating the father questionnaire without first obtaining the parent interview; in only one case was the father component completed (and also the child component) but not the parent component.

Table 33. Number and percent of eligible cases by combination of components, 9-month data collection: 2001–02

Parent	Child	Father	Number	Percent
Total sampled	†	†	13,921	100.0
X	X	X	6,781	48.7
X	X	O	3,440	24.7
X	O	O	296	2.1
X	O	X	171	1.2
O	X	X	1	#
O	X	O	7	#
O	O	X	0	#
O	O	O	3,225	23.2

† Not applicable.
# Rounds to zero.
X Component data provided by the case.
O Component data not provided by the case.
NOTE: Detail may not sum to totals due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

The table shows that the child assessments were completed without the parent interview for only 8 cases, 7 of which also did not complete the father component. Thus, separate weights were not developed for combinations (2) and (6) since analysis of the child assessment data alone (item 2) or child assessment with the father data (item 6) can be conducted using the weights developed for combinations (4) or (7), respectively, with minimal loss of cases. (The 8 cases in rows 6 and 7 of table 33 are not included in the data file.)

On the other hand, a large number of cases had parent interview and child assessment data but did not have father data, so separate sets of weights were developed for both combinations (4) and (7). Also, 171 cases had parent interview and father questionnaire component data but did not have child data, so a set of weights was developed for combination (5) in order to utilize these cases. Finally, 296 cases had parent interview data only, so that a separate set of weights for item (1) was warranted. Since no cases had the father questionnaire data only, possibility (3) was eliminated. As a result, the decision was made to produce four sets of weights.

The four sets of weights, the variable names for each set of weights, and the kind of variables with which they should be used are shown in exhibit 5. Note that cases included in the Parent-

Child and Parent-Father sets of weights are proper subsets of cases included in the Parent set of weights. Similarly, cases included in the Parent-Father-Child set of weights are a proper subset of cases included in the Parent-Father set of weights.

Exhibit 5. Weights for the ECLS-B 9-month data collection: 2001–02

Weight	To be used for analysis of …
W1R0	9-month parent interview data ("P1" prefixed variables), and/or birth certificate data ("BC" prefixed variables) and a limited set of child characteristics reported in the parent interview (e.g., sex and race/ethnicity)
W1C0	9-month child assessment measures ("C1" prefixed variables) alone or in combination with parent interview and/or birth certificate data
W1F0	Resident ("F1" prefixed variables) and/or nonresident father data ("N1" prefixed variables) alone or in combination with data from the parent interview and/or birth certificate data.
W1FC0	Resident and/or nonresident father data in combination with child assessment data alone or in combination with parent interview and/or birth certificate data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort, Nine-Month Data Collection, 2001–02.

4.3 Types of Weight Adjustments

A key objective in adjusting base weights is to compensate for survey nonresponse and survey undercoverage. Adjusting to population totals through poststratification or raking can also reduce standard errors. Weighting adjustments can be separated into two general types:

- Sample-based adjustments, and
- Population-based adjustments.

Both sample-based and population-based weight adjustments were used for the ECLS-B.

In sample-based adjustments, data available for both respondents and nonrespondents are used to adjust the base weights for the respondent sample so that the respondents represent the whole sample (i.e., both respondents and nonrespondents). In population-based adjustments, the respondents' weights are further adjusted so that certain estimates from the weighted respondent sample conform to population values derived independently from an external source.

The basic method used for making sample-based adjustments involves two steps. First, a mutually exclusive and exhaustive classification is defined based on demographic or other characteristics known for all of the sampled cases, both respondents and nonrespondents. Second, within each class, the base weights of all eligible sampled cases are summed and divided by the sum of the respondents' base weights. Finally, the respondents' base weights are multiplied by the resulting ratio to obtain the nonresponse-adjusted weights. If the classes are denoted as G_1, G_2, …, then the ratio adjustment factors for each group are calculated as

$$A_\gamma = \frac{\sum_{t \in G_\gamma} w_t}{\sum_{t \in R \cap G_\gamma} w_t}$$

where A_γ is the adjustment factor for class or adjustment cell G_γ, R denotes the set of survey respondents, and w_t is the base weight for the t-th sampled birth certificate. For respondent t in class G_γ, the adjusted weight is given by $A_\gamma w_t$.

For population-based adjustments, the process is similar, except that the numerator of the ratio is a population total. In the ECLS-B, that would mean the total known birth certificates within a given group:

$$B_\gamma = \frac{T_\gamma}{\sum_{t \in R \cap G_\gamma} w_t}$$

where T_γ is the population total for class or adjustment cell γ.

When the same set of data items is available for both sample-based adjustments and population-based adjustments and the same adjustment classes are used, sample-based adjustments will cancel out in the adjusted weight when making population-based adjustments, making the former unnecessary. Population-based adjustments can compensate for both nonresponse and noncoverage. They also reduce the sampling error of survey estimates related to the variables used in the adjustments. Population-based adjustments require that the same data items be available for respondents and the total population. Given the substantial amount of birth certificate data that was available for all sampled cases and for the total population, raking was used to ensure that sums of sampling weights match known population totals for a sizable number of characteristics. Raking involves making the adjustments for the characteristics in sequence. First, the weights are adjusted to make the sample totals conform to population totals for one classification; then the adjusted weights are further adjusted to make the sample totals conform to the population totals for the next classification, and so on. The process is an iterative one that is carried out repeatedly until convergence is reached (see, for example, Kalton and Flores-Cervantes 2003). The procedure is described further in section 4.5.

4.4 Nonresponse Adjustments

Given the hierarchical nature of the weights developed for the ECLS-B, and since sample-based adjustments require that the same data items be available for both respondents and nonrespondents:

1. Birth certificate data and the base weights were used to calculate nonresponse adjusted Parent weights;

2. Birth certificate, parent component data and the Parent raked weights (see section 4.5 below) were used to calculate nonresponse adjusted Parent-Child and Parent-Father weights; and

3. Birth certificate, parent, and father component data and the Parent-Father raked weights (see section 4.5 below) were used to calculate nonresponse adjusted Parent-Father-Child weights.

The following characteristics were used to define sample-based nonresponse adjustment cells for each set of weights (exhibit 6). These characteristics were selected based on analyses using segmentation modeling via the Chi-Squared Automatic Interaction Detector (CHAID) (see Flores-Cervantes et al. 2002; Kass 1980; Rizzo, Kalton, and Brick 1996). That analysis indicated which characteristics and partitions using those characteristics explain differences in response rates.

Exhibit 6. Variables used to define sample-based nonresponse adjustment cells for each set of weights, 9-month data collection: 2001–02

Parent weights	Parent-Child weights
Foreign resident status Region of residence Population of county of residence Child's race/ethnicity Child's birth weight Five-minute APGAR score Plurality Father's race/ethnicity Mother's age Mother's education Live birth order Number of prenatal visits Delivery complications Medical risk factors Population size of MSA	Foreign resident status Region of residence Population of county of residence Child's race/ethnicity Child's health as reported in the parent component [1] Child's hospitalization status as reported in the parent component [1] Five minute APGAR score Plurality Father's race/ethnicity Mother's age Mother's education Live birth order Number of prenatal visits Medical risk factors
Parent-Father weights	**Parent-Father-Child weights**
A) Cases where only resident fathers apply: Foreign resident status Region of residence Child's race/ethnicity Happiness in marriage as reported in the parent component [1] Father's education—composite [1] Delivery complications Father's age—composite [1] Medical risk factors Five-minute APGAR score Population size of MSA Father's race/ethnicity Number of hours per week spouse worked [1] Population of county of residence Plurality Mother's age Number of prenatal visits Live birth order Mother's education	*A) Cases where only resident fathers apply:* Foreign resident status Region of residence Child's race/ethnicity Father's education—composite [1] Population of county of residence Delivery complications Happiness in marriage as reported in the parent component [1] Medical risk factors Population size of MSA Father's race/ethnicity [1] Number of hours per week spouse worked [1] Five minute APGAR score Plurality Live birth order Father's age—composite [1] Mother's age Number of prenatal visits
B) Cases where only nonresident fathers apply: Child's race/ethnicity Why the biological father hasn't seen the child [1] Population of county of residence Mother's age Region of residence How far away the biological father lives [1] Mother's education	*B) Cases where only nonresident fathers apply:* Child's race/ethnicity Plurality Why the biological father hasn't seen the child [1] Population of county of residence Mother's age Mother's education
C) Cases where both resident fathers and nonresident fathers apply: These cases were assigned to their own adjustment cell.	*C) Cases where both resident fathers and nonresident fathers apply:* These cases were assigned to their own adjustment cell.

[1] These variables came from ECLS-B components; all other variables came from birth certificate data.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort, Nine-Month Data Collection, 2001–02.

The nonresponse adjustment cells were formed with the following general requirements for all four weights:

- The small number of sampled births to foreign residents were assigned to a singular adjustment cell.
- Child's race/ethnicity was used as a segmentation variable at the highest level.
- Cases with resident fathers only, nonresident fathers only, or both were each run through CHAID independently; cases with both kinds of fathers were assigned to a singular cell.
- A minimum cell size of 35 was required.

4.5 Population Raking Adjustments

Population raking adjustments are used to adjust for undercoverage and nonresponse, and to improve the precision of survey estimates. Undercoverage occurs when the sampling frame used does not fully reflect the target population of inference. For this study, the target population is all infants born in the U.S. in 2001 to mothers 15 years of age and older who were not adopted prior to and were alive during the 9-month data collection period. The sampling frame consists of birth certificates available from state registrars. This sampling frame failed to cover unregistered births, but the number of these was thought to be negligible according to the National Center for Health Statistics (NCHS). Infants who were born to mothers under age 15 were excluded from sampling, and infants who were adopted or died prior to 9 months of age were removed during fielding. They are considered outside the ECLS-B target population. Concern about noncoverage in ECLS-B mainly relates to a few PSUs where births were sampled from hospital frames. The PSU-specific weighting adjustment described in section 2.8.5 compensates for any noncoverage in these PSUs. Raking for ECLS-B was therefore done mostly to adjust further for nonresponse and to improve the precision of the estimates.

Poststratification and raking ensure that sums of adjusted weights match known population totals (e.g., population counts for race and ethnicity by age). If population counts of the interior cells of a cross-tabulation are known and the corresponding sample counts are reasonably large, the weight adjustment can be applied at the cross-tabulation cell level. This weight adjustment procedure is called poststratification. Raking is used in situations where the interior cell counts of cross-tabulations are either unknown or sample sizes in some cells are too small for efficient estimation.

The National Center for Health Statistics (NCHS) natality detail files provided sufficient flexibility to generate counts for any level of cross-classification for the ECLS-B weighting adjustments. Therefore, poststratification and raking were both viable options. Raking was chosen for the 9-month data in order to control for a large number of dimensions, as well as to control the cell sizes and adjustment factors.

The raking ratio estimation procedure is based on the iterative proportional fitting procedure of Deming and Stephan (1940) and involves simultaneous ratio adjustments to two or more marginal distributions of the population counts. The raking procedure is carried out in a sequence of adjustments: The base weights are adjusted so that weighted sample totals conform to one marginal distribution, then the adjusted base weights are further adjusted to conform to the second marginal distribution, and so on. One sequence of adjustments to the marginal distributions is known as a cycle or iteration. The procedure is repeated until convergence is achieved. The criteria for convergence can be specified either as the maximum number of iterations or an absolute difference (or relative absolute difference) from the known marginal population totals.

Raking control totals must be consistent with the survey's target population. As noted earlier, the ECLS-B target population is all infants born in the U.S. in 2001 to mothers 15 years of age and older who were not adopted prior to and were alive at the time of the 9-month data collection. Although the NCHS natality detail files contain the mother's age, the files do not indicate adoptions or deaths. Therefore, births to mothers younger than 15 years of age were excluded from both the weighting files and the control total files. Sampled cases who were adopted or deceased prior to the 9-month data collection were included in both the weighting files and the control total files for raking and were subsequently dropped as ineligible. The weighted sums obtained after adjustment by excluding these cases in tabulations and analysis represent an estimate of the target population size.

Each of the four sets of sample-based nonresponse-adjusted weights were raked to the same following 11 dimensions (using birth certificate data for the full population of births in 2001):

1. Child's sex;
2. Child's race/ethnicity based on information from the birth certificate;
3. Child's plurality (single, twin, triplets and higher order births);

4. Population size of metropolitan statistical area (MSA);
5. Region of residence;
6. Presence of medical risk factors;
7. Child's birth weight;
8. Mother's age at time of birth;
9. Total birth order;
10. Mother's education at time of birth; and
11. Number of prenatal visits.

These variables were selected because of their substantive interest, and their relationship to response propensity was verified by logistic regression analyses.

Table 34 gives the sum of the full sample weights both before and after raking, along with the corresponding population counts, for each dimension and for the Parent and Parent-Child sets of weights. Table 35 gives similar information for the Parent-Father and Parent-Father-Child sets of weights. It should be noted that the control totals differ between the Parent and the Parent-Child weights (3,997,169) and the Parent-Father and Parent-Father-Child weights (3,618,138). This reflects the fact that some of the ECLS-B target population of children have neither a resident father nor a nonresident father who meets the eligibility criteria. This output was reviewed as part of the quality control for the weights.

Generally speaking, the sums of nonresponse-adjusted weights should estimate the population total, whereas the sums of raked weights should be equal to the population total. The ratios of the control totals to corresponding sums of nonresponse adjusted weights in tables 34 and 35 show that, for most raking dimension variables and levels, the sums of weights are close to the population totals. In most cases where the ratio deviates from 1.0, the confidence interval for the sums of nonresponse adjusted weights covers the population totals. Given the sequential development of the weights, the Parent-Child nonresponse adjusted weights closely approximate the control totals given the raking of the Parent weights. Similarly, the Parent-Father-Child nonresponse adjusted weights closely approximate the control totals given the raked Parent-Father weights.

Table 34. ECLS-B, control totals and sums of full sample weights before and after raking for Parent and Parent-Child weights, 9-month data collection: 2001–02

Characteristic	Control totals	Parent weighted total before raking	Ratio of control total to Parent weighted total	Parent raked weighted total (W1R0)	Parent-Child weighted total before raking	Ratio of control total to Parent-Child weighted total	Parent-Child raked weighted total (W1C0)
Total births	3,997,169	4,038,096	0.99	3,997,169	3,997,169	1.00	3,997,169
Child’s sex						1.00	
Male	2,044,894	2,089,351	0.98	2,044,894	2,046,986	1.00	2,044,894
Female	1,952,275	1,948,745	1.00	1,952,275	1,950,183	1.00	1,952,275
Child's race/ethnicity							
American Indian[1]	54,397	51,404	1.06	54,397	54,370	1.00	54,397
Chinese	23,634	21,493	1.10	23,634	23,634	1.00	23,634
Other Asian or Pacific Islander	149,658	208,956	0.72	149,658	149,658	1.00	149,658
Hispanic	832,439	799,933	1.04	832,439	832,473	1.00	832,439
Black	579,725	598,532	0.97	579,725	579,725	1.00	579,725
White	2,357,316	2,357,778	1.00	2,357,316	2,357,310	1.00	2,357,316
Child's plurality							
Single	3,870,450	3,912,810	0.99	3,870,450	3,870,803	1.00	3,870,450
Twin	119,498	119,506	1.00	119,498	119,384	1.00	119,498
Triplets or higher	7,222	5,780	1.25	7,222	6,982	1.03	7,222
Population size of metropolitan statistical area							
250,000 or more	2,960,192	2,813,568	1.05	2,960,192	2,954,650	1.00	2,960,192
100,000–250,000	295,608	371,128	0.80	295,608	298,724	0.99	295,608
Less than 100,000	26,476	27,212	0.97	26,476	25,161	1.05	26,476
Not applicable	709,304	817,673	0.87	709,303	713,044	0.99	709,303
Foreign residents	5,590	8,515	0.66	5,590	5,590	1.00	5,590

See notes at end of table.

Table 34. ECLS-B, control totals and sums of full sample weights before and after raking, for Parent and Parent-Child weights, 9-month data collection: 2001–02—Continued

Characteristic	Control totals	Parent weighted total before raking	Ratio of control total to Parent weighted total	Parent raked weighted total (W1R0)	Parent-Child weighted total before raking	Ratio of control total to Parent-Child weighted total	Parent-Child raked weighted total (W1C0)
Region of residence							
Foreign residents	5,590	8,515	0.66	5,590	5,590	1.00	5,590
Northeast	679,362	657,777	1.03	679,363	676,298	1.00	679,363
Midwest	877,396	913,644	0.96	877,396	879,394	1.00	877,396
South	1,466,465	1,523,615	0.96	1,466,465	1,480,627	0.99	1,466,465
West	968,356	934,544	1.04	968,356	955,260	1.01	968,356
Presence of medical risk factors							
No	3,371,888	3,381,752	1.00	3,371,887	3,371,856	1.00	3,371,887
Yes	625,282	656,344	0.95	625,282	625,313	1.00	625,282
Child's birth weight							
499 gm or less	23,171	16,418	1.41	23,171	22,737	1.02	23,171
500–999 gm	28,091	26,233	1.07	28,091	28,090	1.00	28,091
1,000–1,499 gm	59,689	60,489	0.99	59,689	60,016	0.99	59,689
1,500–1,999 gm	188,254	188,417	1.00	188,254	188,125	1.00	188,254
2,000–3,499 gm	2,184,784	2,203,782	0.99	2,184,784	2,184,621	1.00	2,184,784
3,500–4,499 gm	1,456,497	1,489,848	0.98	1,456,497	1,454,398	1.00	1,456,497
4,500–8,165 gm	56,683	52,910	1.07	56,683	59,183	0.96	56,683
Mother's age at time of birth							
Under 15 years	†	†	†	†	†	†	†
15–19 years	440,690	440,055	1.00	440,691	444,466	0.99	440,691
20–24 years	1,013,583	1,084,619	0.93	1,013,583	1,014,882	1.00	1,013,583
25–29 years	1,055,712	1,035,291	1.02	1,055,712	1,055,289	1.00	1,055,712
30–34 years	939,399	903,556	1.04	939,399	939,325	1.00	939,399
35–39 years	450,992	470,584	0.96	450,991	450,284	1.00	450,991
40–44 years	91,799	98,985	0.93	91,799	89,332	1.03	91,799
45–54 years	4,993	5,007	1.00	4,993	3,592	1.39	4,993

See notes at end of table.

Table 34. ECLS-B, control totals and sums of full sample weights before and after raking, for Parent and Parent-Child weights, 9-month data collection: 2001–02—Continued

Characteristic	Control totals	Parent weighted total before raking	Ratio of control total to Parent weighted total	Parent raked weighted total (W1R0)	Parent-Child weighted total before raking	Ratio of control total to Parent-Child weighted total	Parent-Child raked weighted total (W1C0)
Birth order							
First child	1,315,969	1,271,453	1.04	1,315,969	1,332,457	0.99	1,315,969
Second child	1,173,732	1,241,822	0.95	1,173,732	1,163,785	1.01	1,173,732
Third child	748,529	741,692	1.01	748,529	739,963	1.01	748,529
Fourth child	388,855	413,186	0.94	388,855	390,745	1.00	388,855
Fifth or over	370,084	369,943	1.00	370,085	370,220	1.00	370,085
Mother's education at time of birth							
0–12 years	845,982	826,283	1.02	845,982	844,396	1.00	845,982
12 years	1,245,252	1,251,800	0.99	1,245,252	1,251,436	1.00	1,245,252
13–15 years	854,270	875,397	0.98	854,270	846,938	1.01	854,270
16 years and over	998,722	1,026,911	0.97	998,722	1,003,731	1.00	998,722
Not stated	52,944	57,705	0.92	52,944	50,669	1.04	52,944
Number of prenatal visits							
0 to 4 visits	162,690	163,221	1.00	162,690	161,386	1.01	162,690
5–6 visits	178,592	167,578	1.07	178,592	179,954	0.99	178,592
7–8 visits	340,031	338,237	1.01	340,031	340,382	1.00	340,031
9–10 visits	772,630	767,655	1.01	772,630	771,142	1.00	772,630
11–14 visits	1,822,322	1,863,228	0.98	1,822,322	1,824,717	1.00	1,822,322
15 or more visits	720,905	738,176	0.98	720,905	719,589	1.00	720,905

† Not applicable.
[1] American Indian includes Alaska Native.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort, Nine-Month Data Collection, 2001–02.

Table 35. ECLS-B, control totals and sums of full sample weights before and after raking, for Parent-Father and Parent-Father-Child weights, 9-month data collection: 2001–02

Characteristic	Control totals	Parent-Father weighted total before raking	Ratio of control total to Parent-Father weighted total	Parent-Father raked weighted total (W1F0)	Parent-Father-Child weighted total before raking	Ratio of control total to Parent-Father-Child weighted total	Parent-Father-Child raked weighted total (W1FC0)
Total births	3,618,138	3,635,951	1.00	3,618,137	3,618,138	1.00	3,618,137
Child's sex							
Male	1,858,909	1,871,878	0.99	1,858,909	1,854,984	1.00	1,858,909
Female	1,759,229	1,764,073	1.00	1,759,229	1,763,153	1.00	1,759,229
Child's race/ethnicity							
American Indian[1]	47,238	48,502	0.97	47,238	47,196	1.00	47,238
Chinese	23,357	23,362	1.00	23,357	23,368	1.00	23,357
Other Asian or Pacific Islander	139,893	140,885	0.99	139,894	139,887	1.00	139,894
Hispanic	746,252	748,046	1.00	746,252	746,289	1.00	746,252
Black	457,360	459,993	0.99	457,360	457,270	1.00	457,360
White	2,204,037	2,215,163	0.99	2,204,037	2,204,126	1.00	2,204,037
Child's plurality							
Single	3,514,342	3,522,907	1.00	3,514,342	3,513,858	1.00	3,514,342
Twin	96,574	106,961	0.90	96,574	96,988	1.00	96,574
Triplets or higher	7,222	6,083	1.19	7,222	7,292	0.99	7,222
Population size of metropolitan statistical area							
250,000 or more	2,672,951	2,661,573	1.00	2,672,951	2,671,317	1.00	2,672,952
100,000–250,000	268,664	275,463	0.98	268,664	272,185	0.99	268,664
Less than 100,000	22,958	27,378	0.84	22,958	21,685	1.06	22,958
Not applicable	647,974	665,947	0.97	647,975	647,361	1.00	647,974
Foreign residents	5,590	5,590	1.00	5,590	5,590	1.00	5,590

See notes at end of table.

Table 35. ECLS-B, control totals and sums of full sample weights before and after raking, for Parent-Father and Parent-Father-Child weights, 9-month data collection: 2001–02—Continued

Characteristic	Control totals	Parent-Father weighted total before raking	Ratio of control total to Parent-Father weighted total	Parent-Father raked weighted total (W1F0)	Parent-Father Child weighted total before raking	Ratio of control total to Parent-Father-Child weighted total	Parent-Father-Child raked weighted total (W1FC0)
Region of residence							
Foreign residents	5,590	5,590	1.00	5,590	5,590	1.00	5,590
Northeast	610,462	600,160	1.02	610,461	602,952	1.01	610,462
Midwest	803,304	818,851	0.98	803,304	812,339	0.99	803,304
South	1,323,301	1,351,339	0.98	1,323,301	1,328,529	1.00	1,323,301
West	875,481	860,012	1.02	875,481	868,728	1.01	875,481
Presence of medical risk factors							
No	3,060,024	3,088,832	0.99	3,060,024	3,058,426	1.01	3,060,024
Yes	558,114	547,119	1.02	558,114	559,711	1.00	558,114
Child's birth weight							
499 gm or less	19,320	19,813	0.98	19,320	18,760	1.03	19,320
500-999 gm	24,549	25,514	0.96	24,549	24,222	1.01	24,549
1,000–1,999 gm	49,341	51,856	0.95	49,341	48,959	1.01	49,341
1,500–1,999 gm	160,817	160,395	1.00	160,817	159,609	1.01	160,817
2,000–2,499 gm	1,965,799	1,970,321	1.00	1,965,800	1,961,415	1.00	1,965,799
3,500–4,499 gm	1,345,002	1,350,303	1.00	1,345,002	1,350,941	1.00	1,345,002
4,500–8,165 gm	53,309	57,749	0.92	53,309	54,232	0.98	53,309
Mother's age at time of birth							
Under 15 years	†	†	†	†	†	†	†
15–19 years	361,959	393,352	0.92	361,959	364,847	0.99	361,960
20–24 years	876,806	862,529	1.02	876,806	878,411	1.00	876,807
25–29 years	967,903	961,137	1.01	967,903	966,098	1.00	967,902
30–34 years	890,654	896,291	0.99	890,654	895,821	0.99	890,653
35–39 years	430,094	438,962	0.98	430,095	423,435	1.02	430,094
40–44 years	87,174	80,456	1.08	87,174	85,909	1.01	87,174
45–54 years	3,547	3,223	1.10	3,547	3,616	0.98	3,547

See notes at end of table.

Table 35. ECLS-B, control totals and sums of full sample weights before and after raking, for Parent-Father and Parent-Father-Child weights, 9-month data collection: 2001–02—Continued

Characteristic	Control totals	Parent-Father weighted total before raking	Ratio of control total to Parent-Father weighted total	Parent-Father raked weighted total (W1F0)	Parent-Father-Child weighted total before raking	Ratio of control total to Parent-Father-Child weighted total	Parent-Father-Child raked weighted total (W1FC0)
Birth order							
First child	1,165,561	1,224,917	0.95	1,165,561	1,170,835	1.00	1,165,561
Second child	1,090,636	1,087,807	1.00	1,090,636	1,076,912	1.01	1,090,635
Third child	688,223	681,321	1.01	688,223	689,097	1.00	688,223
Fourth child	347,117	331,462	1.05	347,117	353,765	0.98	347,118
Fifth or over	326,601	310,444	1.05	326,601	327,528	1.00	326,601
Mother’s education at time of birth							
0–12 years	708,836	742,047	0.96	708,836	707,134	1.00	708,836
12 years	1,101,199	1,073,923	1.03	1,101,199	1,106,342	1.00	1,101,199
13–15 years	791,399	782,559	1.01	791,399	787,765	1.00	791,399
16 years & over	973,201	996,348	0.98	973,201	974,174	1.00	973,201
Not stated	43,502	41,075	1.06	43,503	42,722	1.02	43,503
Number of prenatal visits							
0–4 visits	133,167	138,002	0.96	133,168	134,447	0.99	133,168
5–6 visits	151,636	147,793	1.03	151,636	150,117	1.01	151,636
7–8 visits	299,793	303,693	0.99	299,793	296,282	1.01	299,793
9–10 visits	701,567	687,955	1.02	701,567	704,591	1.00	701,567
11–14 visits	1,673,388	1,694,163	0.99	1,673,388	1,671,276	1.00	1,673,388
15 or more visits	658,585	664,345	0.99	658,585	661,425	1.00	658,585

† Not applicable.
[1] American Indian includes Alaska Native.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort, Nine-Month Data Collection, 2001–02.

4.6 Characteristics of Weights

Table 36 reports selected characteristics of the four sets of weights: the name of the full sample weight; the count of records with a non-missing value of that weight; and the mean, standard deviation, coefficient of variation (CV), minimum, maximum, skewness, kurtosis, and sum of that weight. The change in the coefficient of variation of the weights was closely monitored through the various weight adjustments and from one set of weights to another. Most of the variability in the weights starts in the base weights, which reflects the oversampling required in some ECLS-B analytic domains.

Table 36. Characteristics of cross-sectional weights, 9-month data collection: 2001–02

Weight description (variable name)	Number of cases	Mean	Standard deviation	Coefficient of variation (x100)	Minimum	Maximum	Skewness	Kurtosis	Sum
Base weight (W1BASEWT)	10,688	280.10	244.65	87.34	3.27	1,015.62	0.46	-1.30	2,993,735
Parent weight adjusted for non-response	10,688	377.82	338.31	89.54	4.37	2,890.44	0.63	-0.67	4,038,096
Raked Parent weight (W1R0)	10,688	373.99	349.31	93.40	4.08	1,854.91	0.74	-0.64	3,997,169
Parent-Child weight adjusted for nonresponse	10,221	391.07	365.35	93.42	4.61	1,888.26	0.77	-0.57	3,997,169
Raked Parent-Child weight (W1C0)	10,221	391.07	365.54	93.47	4.72	1,981.78	0.77	-0.56	3,997,169
Parent-Father weight adjusted for nonresponse	6,988	520.31	507.49	97.53	5.06	3,784.90	1.08	1.11	3,635,951
Raked Parent-Father weight (W1F0)	6,988	517.76	509.06	98.32	5.53	3,850.44	1.08	1.03	3,618,138
Parent-Father-Child weight adjusted for nonresponse	6,816	530.83	524.69	98.84	5.96	4,098.98	1.15	1.54	3,618,138
Raked Parent-Father-Child weight (W1FC0)	6,816	530.83	525.25	98.95	5.95	4,050.91	1.16	1.58	3,618,138

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort, Nine-Month Data Collection, 2001–02.

5. NONRESPONSE BIAS ANALYSIS

5.1 Introduction

5.1.1 Purpose of the Nonresponse Bias Analysis

The *NCES Statistical Standards* (U.S. Department of Education, National Center for Education Statistics 2003, Standard 4-4-1) specify that, before data can be released, the potential magnitude of nonresponse bias must be investigated for any stage of sample selection where response rates fall below 85 percent.. As seen in chapter 3, the overall weighted response rate for the parent computer-assisted personal interview (CAPI) instrument in the ECLS-B is 74.1 percent, with lower unconditional response rates for both child assessments and father questionnaires. Thus the potential magnitude of nonresponse bias needs to be evaluated for all the components of the first wave of the ECLS-B. This chapter reports the results of these evaluations.

5.1.2 Evaluating Nonresponse Bias

Nonresponse bias occurs when the expected value of a survey estimate computed for the respondents is different from the expected value of the estimate that would have been obtained had all sampled eligible persons responded to the survey. For example, persons who cannot be located may differ in a systematic way in their survey responses from persons who can be located. Similarly, persons who refuse to participate in the survey may differ systematically from persons who are willing to participate. When such systematic differences exist, nonresponse bias can occur.

Nonresponse bias will affect a given survey item when the following two conditions hold:

1. On average, the data for the item must differ between nonrespondents and respondents; that is, the data provided by respondents for the item and the data that nonrespondents *would have provided* must differ, at least to some degree; and

2. The response rate must be low enough for this difference to have an appreciable effect.

The nonresponse bias of the sample respondent mean of variable *y*, is given by

$$B(\bar{y}_R) \approx E(\bar{y}_R) - \bar{Y} \tag{5.1}$$

where $\bar{Y}$ is the overall population mean. This formula can be re-expressed as

$$B(\bar{y}_R) \approx (1-r)(\bar{Y}_R - \bar{Y}_{NR}) \tag{5.2}$$

where *r* represents the response rate, $\bar{Y}_R$ and $\bar{Y}_{NR}$ represent the population means of the variable *y* for respondents and nonrespondents, respectively (Kasprzyk et al. 2001). Since a proportion is a special case of an arithmetic mean obtained by scoring $y_i = 1$ if individual *i* has the attribute in question and $y_i = 0$ otherwise, these formulas also apply to proportions. The formulas apply for estimators that do not include weighting adjustments that attempt to compensate for nonresponse bias.

It can be seen from formula 5.2 that when the response rate is close to 1.0, so that the term $(1 - r)$ is small, then differences between respondents and nonrespondents are less important. Similarly, when there is little difference between respondents and nonrespondents the term $(\bar{Y}_{\mathrm{R}} - \bar{Y}_{\mathrm{NR}})$ will be small and the level of the response rate is less important.

The evaluation of nonresponse bias in this report is based on estimates for differences between respondents and nonrespondents based on “internal” data sources, consisting of the sampling frame and survey data. This approach is described in the next section. In addition, the impact of nonresponse weighting adjustments will be considered.

5.1.3 Evaluation of Nonresponse in the ECLS-B

Using information about response rates and differences between respondents and nonrespondents, formula 5.2 provides a means for estimating the potential for nonresponse bias. However, because the survey data for nonrespondents are unknown, the difference $\bar{Y}_{\mathrm{R}} - \bar{Y}_{\mathrm{NR}}$ is never known for the survey items themselves. Among the numerous methods described in *Measuring and Reporting Sources of Error in Surveys* (Kasprzyk et al. 2001), only one approach for estimating the order of magnitude of differences between respondents and nonrespondents is suitable for the ECLS-B.

The approach is to compare the characteristics of respondents and nonrespondents using data available on the sampling frame. Though widely used, this method is limited, since frame characteristics may be only weakly correlated with survey data (*NCES Statistical Standards*, U.S. Department of Education, National Center for Education Statistics 2003). Nonetheless, this approach is well-suited to the ECLS-B because of the substantial amount of data on birth certificate records—the ECLS-B sampling frame—that are available for both respondents and nonrespondents. Differences between respondents and nonrespondents estimated through this method can then be combined with response rates through equation 5.2 to obtain estimates of potential nonresponse bias.

Another possible approach is based on comparing respondents who were difficult to reach with respondents who were easier to contact (U.S. Department of Education 2003, Guideline 4-4-2D, Kasprzyk et al. 2001, p. 4-10; Moonesinghe, Mitchell, and Pasquini 1995; Bull et al. 1988; Siemiatycki and Campbell 1984; O'Neil 1979; and Kish 1965, p. 557). This approach has the advantage of being applicable to the survey items themselves. This method was investigated, but eventually ruled out. The method is based on the assumption that respondents who were more difficult to reach are more like nonrespondents than respondents who were easier to reach. This assumption was evaluated by looking for trends in survey estimates by the number of attempted contacts required to complete data collection for the case,[1] together with a comparison of base-weighted estimates for respondents to the CAPI instrument with those for nonrespondents. The evaluation considered data items that were available from the sampling frame, including age of mother, age of father, mother's years of education, birth order, child's race/ethnicity (as determined for sampling), plurality, number of prenatal visits, APGAR score, alcohol use during pregnancy, medical risk factors, complication during delivery, congenital anomalies, birth weight, plurality, size of PMSA/MSA[2] of residence, and census region of residence.

The results of this evaluation are shown in table 37. There is little indication in these data that nonrespondents are consistently more similar to respondents who required more attempted contacts than to respondents who required fewer contacts. While many estimates exhibit trends by number of

[1] The value given is the number of attempted contacts necessary to complete data collection for the entire instrument.
[2] PMSAs (Primary Metropolitan Statistical Areas) are made up of contiguous MSAs (Metropolitan Statistical Areas) of 1,000,000 or more people.

Table 37. Estimates for birth certificate data for respondents to the parent CAPI instrument, by attempted contacts, and for nonrespondents, 9-month data collection: 2001–02

Characteristic	Number of attempted contacts (estimates closest to nonrespondents are in bold)[1,2]				Nonrespondents[2]
	1 or 2	3 or 4	5 to 7	8 or more	
Overall sample size	4,005	2,683	2,027	1,973	3,233
Age of mother (years)					
Mean	**27.8**	27.4	27.0	26.5	27.9
Standard error	0.17	0.14	0.17	0.17	0.15
Age of father (years)					
Mean	**30.9**	30.7	30.0	29.5	30.8
Standard error	0.18	0.17	0.20	0.19	0.17
Education of mother (years)					
Mean	**14.1**	14.2	14.3	13.9	14.0
Standard error	0.19	0.20	0.29	0.27	0.26
Child's race/ethnicity (percent)					
American Indian/Alaska Native	1.4	**1.0**	1.2	1.4	1.0
Chinese	0.5	0.5	**0.6**	0.5	0.8
Other Asian/Pacific Islander	4.9	4.9	**5.7**	5.3	6.0
Hispanic	18.0	18.6	**21.3**	22.4	21.2
Black, non-Hispanic	**13.8**	14.1	16.0	16.5	11.6
White, non-Hispanic	61.4	**60.8**	55.24	53.9	59.4
Birth order					
Mean	**2.5**	**2.5**	2.4	2.4	2.5
Standard error	0.03	0.03	0.04	0.03	0.04
Number of prenatal visits					
Mean	11.5	11.6	11.5	**11.2**	11.3
Standard error	0.10	0.11	0.12	0.15	0.13
Five-minute APGAR score					
Mean	**8.9**	**8.9**	**8.9**	9.0	8.9
Standard error	0.02	0.02	0.02	0.02	0.01

See notes at end of table.

Table 37. Estimates for birth certificate data for respondents to the parent CAPI instrument, by attempted contacts. and for nonrespondents, 9-month data collection: 2001–02—Continued

Characteristic	Number of attempted contacts (estimates closest to nonrespondents are in bold)[1,2]				Nonrespondents[2]
	1 or 2	3 or 4	5 to 7	8 or more	
Alcohol use during pregnancy (percent)					
Yes	0.6	**0.7**	0.6	**0.7**	1.1
No	86.5	**84.9**	86.0	84.2	84.9
Unknown	12.9	**14.4**	13.4	15.1	14.0
Medical risk factors (e.g., anemia, cardiac disease, lung disease, tobacco or alcohol use, weight gain, etc.) (percent)					
None reported	83.6	**84.3**	83.3	**84.3**	85.3
One or more risk factors reported	16.4	**15.7**	16.7	**15.7**	14.7
Complications during delivery (e.g., febrile, moderate/heavy meconium, etc.) (percent)					
None reported	**77.2**	79.8	80.1	78.7	77.4
One or more complications reported	**22.8**	20.2	19.9	21.3	22.6
Congenital anomalies (percent)					
None reported	99.0	99.0	**98.7**	98.6	98.8
One or more complications reported	1.0	1.0	**1.3**	1.4	1.2
Birth weight (grams)					
Mean	**3,334**	3,323	3,317	3,311	3,343
Standard error	11.6	12.5	12.5	12.6	11.2
Plurality (percent)					
Single	95.8	97.1	**97.4**	98.1	97.7
Twin	4.0	2.8	**2.5**	1.8	2.2
Triplet	0.2	0.1	0.1	0.1	0.1
Quintuplet	0.0	†	0.1	†	†

See notes at end of table.

Table 37. Estimates for birth certificate data for respondents to the parent CAPI instrument, by attempted contacts, and for nonrespondents, 9-month data collection: 2001–02—Continued

Characteristic	Number of attempted contacts (estimates closest to nonrespondents are in bold)[1,2]				Nonrespondents[2]
	1 or 2	3 or 4	5 to 7	8 or more	
PMSA/MSA population size (percent)					
250,000 or more	**70.6**	69.8	68.6	69.8	74.6
100,000 to 250,000	**8.2**	9.2	10.0	9.9	7.5
100,000 or less	0.6	0.5	0.6	**0.7**	0.7
Non-metropolitan	**20.3**	20.5	20.7	19.3	16.6
Foreign resident[3]	**0.3**	0.1	0.2	**0.3**	0.7
Census region of residence (percent)					
Foreign resident[3]	**0.3**	0.1	0.2	**0.3**	0.6
Northeast	16.7	17.6	**17.8**	15.5	20.6
Midwest	25.1	22.7	**20.6**	19.3	20.2
South	34.7	**37.6**	39.4	39.2	36.2
West	23.2	22.0	**22.1**	25.7	22.4

† Not applicable—no sampled persons in this category.
[1] "Respondents" refers to respondents to the parent CAPI instrument.
[2] Estimates for both respondents and nonrespondents are calculated using the base weight (W1BASEWT).
[3] While six children are shown as having permanent residence outside the 50 states or the District of Columbia, all interviews were done in the United States.
NOTE: Detail may not sum to totals due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

attempted contacts, there are only 2 variables where the estimate for nonrespondents is numerically closer to the estimate for the group with the most attempted contacts than other groups (prenatal visits and residence in MSAs with 100,000 population or less). On the other hand, there are at least 15 cases where the estimated value for nonrespondents is numerically closest to that of respondents with the *least* attempted contacts.[3] Clearly, the assumption that nonrespondents are most similar to respondents with the most attempted contacts is not supported for these data.

One possible reason for this lack of relationship between attempted contacts and likelihood of response is the complex nature of the data collection process in ECLS-B. In the ECLS-B, any households with a resident and/or nonresident father might require more contacts to complete data

[3] Dichotomous variables are counted only once.

collection regardless of likelihood of response to the parent CAPI instrument. On the other hand, if it was learned that a sampled case had moved a sufficient distance from the county where the birth was sampled, then one contact alone would suffice to determine the case as a nonrespondent. In any case, it is clear from the data in table 37 that little relationship exists between frequency of attempted contact and likelihood of response and, as a result, this analysis was not pursued.

Given the findings in table 37, the evaluation of nonresponse bias is restricted to comparisons of birth certificate data for respondents and nonrespondents. These comparisons are presented in section 5.2. The latter part of the evaluation compares estimates generated with base weights and estimates generated with the final sampling weights in order to examine the effectiveness of the weighting adjustments in reducing any nonresponse bias in the survey estimates.

5.2 Comparisons Between Respondents and Nonrespondents

5.2.1 Data Being Compared

Analyses of the birth certificate frame data may indicate ways in which respondents and nonrespondents systematically differ, either in characteristics of parents (e.g., age or education) or physical characteristics of the infant (e.g., low birth weight). If there is evidence of such differences, then it could imply the potential for differences between respondents and nonrespondents in their answers to survey questions.

For the ECLS-B, data on the standard U.S. birth certificate records are available for all sampled records. These data include the following items that will be analyzed:

- Age of mother;
- Age of father;
- Mother's education;
- Child's race (as derived from birth certificate data on mother's and father's race; see section 4.4.4 of the *Nine-Month User's Manual.*
- Birth order;
- Number of prenatal visits;

- Five-minute APGAR score;
- Mother's alcohol use during pregnancy;
- Presence of medical risk factors;
- Presence of complications in labor and delivery;
- Presence of congenital anomalies;
- Birth weight;
- Plurality;
- Population of PMSA/MSA where the mother resided at the time of birth; and
- Census region where the mother resided when interviewed.

These variables were selected to reflect important characteristics of parents (mother's education, mother's and father's ages); child's race/ethnicity (as derived from parents' race/ethnicity); child health and development (APGAR score, prenatal visits, birth weight, birth order, plurality, risk factors, congenital anomalies, birth complications, prenatal alcohol use); and geographic characteristics (size of metropolitan area and census region).

5.2.2 Summary of Differences Between Respondents and Nonrespondents

The comparisons of respondents and nonrespondents in terms of the characteristics listed above are presented in table 38. The means and percentages in the table are computed using the base weights that are the inverses of the children's selection probabilities. The difference between the respondent and nonrespondent means (or percentage) is calculated as (nonrespondent mean – respondent mean). A *p*-value is given for a test of significance of the difference between the nonrespondent and respondent means, with the standard error of the difference being computed using a jackknife repeated replication method that reflects the complex sample design for the ECLS-B. The significance test used for comparing percentage distributions was the modified chi-square test of Rao and Scott (1981, 1984) that reflects the complex sample design.

There were no statistically significant (i.e., $p \leq .05$) differences with respect to birth weight, delivery complications, congenital anomalies, medical risk factors (other than alcohol use), APGAR score, mother's education, or birth order. There were statistically significant but rather small differences between nonrespondents and respondents with respect to percent reporting alcohol use during pregnancy (0.5 percent of respondents versus 1.1 percent of nonrespondents), mean age of mother (27.1 years versus 27.9 years), mean age of father (30.2 years versus 30.8 years), mean number of prenatal visits (11.6 versus 11.3), and plurality (3.1 percent twins among respondents versus 2.1 percent among nonrespondents).

Finally, there were significant differences in child's race, size of urban area of residence, and region of residence. Specifically, respondents were about 4 percent more likely to be Black, non-Hispanic (15.9 percent versus 11.6 percent), less likely to reside in larger metropolitan areas (68.1 percent versus 74.6 percent in areas of 250,000 or more), and less likely to reside in the Northeast census region (15.6 percent versus 20.6 percent).

Table 38. Comparison of characteristics of ECLS-B respondents and nonrespondents, 9-month data collection: 2001–02

Characteristic	Respondents	Non-respondents	Difference	t or χ^2 value	Degrees of freedom	p-value	Non-respondent sample size	Respondent sample size
Age of mother (years)								
Mean	27.1	27.9	-0.8	-3.90	†	0.000	3,227	10,608
Standard error	0.14	0.15	†	§	†	§	†	†
Age of father (years)								
Mean	30.2	30.8	-0.6	-2.65	†	0.002	2,802	9,178
Standard error	0.15	0.17	†	§	†	§	†	†
Education of mother (years)								
Mean	14.1	14.0	0.1	0.33	†	0.790	3,227	10,608
Standard error	0.16	0.26	†	§	†	§	†	†
Child's race/ethnicity (percent)								
American Indian/Alaska Native	1.4	1.0	0.4	49.96	5	0.000	229	873
Chinese	0.5	0.8	-0.3	§	§	§	266	466
Asian	4.9	6.0	-1.1	§	§	§	487	1345
Hispanic	19.3	21.2	-1.9	§	§	§	503	1581
Black, non-Hispanic	15.9	11.6	4.3	§	§	§	390	1771
White, non-Hispanic	58.1	59.4	-1.3	§	§	§	1,358	4,652
Birth order								
Mean	2.5	2.5	0.0	0.00	†	0.718	3,227	10,608
Standard error	0.02	0.04	†	§	†	§	†	†
Number of prenatal visits								
Mean	11.6	11.3	0.3	1.90	†	0.012	3,104	10,240
Standard error	0.09	0.13	†	§	†	§	†	†
Five-minute APGAR score								
Mean	8.9	8.9	0.0	0.00	†	0.826	2,481	8,466
Standard error	0.02	0.01	†	§	†	§	†	†

See notes at end of table.

Table 38. Comparison of characteristics of ECLS-B respondents and nonrespondents, 9-month data collection: 2001–02—Continued

Characteristic	Respondents	Non-respondents	Difference	χ^2 value	Degrees of freedom	*p*-value	Non-Respondent sample size	Respondent sample size
Alcohol use during pregnancy (percent)								
Yes	0.5	1.1	-0.6	7.02	2	0.030	39	70
No	85.6	84.9	0.7	§	§	§	2,588	8,817
Unknown	13.8	14.0	-0.2	§	§	§	600	1,721
Medical risk factors (e.g., anemia, cardiac disease, lung disease, tobacco or alcohol use, weight gain, etc.) (percent)								
None reported	83.4	85.3	-1.9	2.52	1	0.113	2,690	8,644
One or more risk factors reported	16.6	14.7	1.9	§	§	§	543	2,044
Complications during delivery (percent)								
None reported	79.3	77.4	1.9	3.06	1	0.080	2,373	7,948
One or more complications reported	20.7	22.6	1.9	§	§	§	860	2,740
Congenital anomalies (percent))								
None reported	99.0	98.8	.02	0.54	1	0.463	3,185	10,549
One or more anomalies reported	1.0	1.2	-.02	§	§	§	48	139
Birth weight (grams)								
Mean	3,319.1	3,343.4	-24.3	-1.80	†	0.054	3,227	10,608
Standard error	7.58	11.18	†	§	†	§	†	†
Plurality (percent)								
Single	96.6	97.7	-1.1	†	2	0.000	2,844	8,873
Twin	3.1	2.1	1.0	†	§	§	365	1,658
Triplet	0.1	0.1	0.0	†	§	§	17	66
Quadruplet	†	†	†	†	†	†	0	11

See notes at end of table.

Table 38. Comparison of characteristics of ECLS-B respondents and nonrespondents, 9-month data collection: 2001–02—Continued

Characteristic	Respondents	Non-respondents	Difference	χ^2 value	Degrees of freedom	p-value	Non-Respondent sample size	Respondent sample size
PMSA/MSA population size[1] (percent)								
250,000 or more	68.1	74.6	-6.5	27.52	4	0.000	2,488	7,487
100,000 to 250,000	9.8	7.5	2.3	§	§	§	214	985
100,000 or less	0.6	0.7	-0.1	§	§	§	24	57
Non-metro	21.3	16.6	4.7	§	§	§	483	2,073
Foreign resident	0.1	0.6	-0.5	§	§	§	18	6
							18	6
Census region of residence (percent)								
Foreign resident	0.1	0.6	-0.5	21.54	3	0.000	18	6
Northeast	15.6	20.6	-5.0	§	§	§	624	1,645
Midwest	22.9	20.2	2.7	§	§	§	633	2,411
South	37.9	36.2	1.6	§	§	§	1,070	3,705
West	23.5	22.4	1.3	§	§	§	882	2,841

† Not applicable.

§ Degrees of freedom, χ^2 value, and *p*-value apply to all levels of the variable shown at left.

[1]PMSAs (Primary Metropolitan Statistical Areas) are made up of contiguous MSAs (Metropolitan Statistical Areas) of 1,000,000 or more people.

NOTE: Calculations weighted by the base weight (W1BASEWT). Detail may not sum to totals due to rounding

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

There are a number of significant differences in this analysis that indicate the possibility of some nonresponse bias. However, the estimated differences between respondents and nonrespondents are mostly small, with the most striking differences noted in child's race/ethnicity, size of metropolitan area, and region of residence. However, the magnitudes of these differences are so small that they seem unlikely to contribute to nonresponse bias.

5.3 Impact of Nonresponse Weighting Adjustments

The nonresponse adjustments to the base weights were applied in order to reduce nonresponse bias. The nonresponse adjustments in the ECLS-B made extensive use of birth certificate data and should have corrected for at least some of the differences observed between respondents and nonrespondents.

This section considers the impact of nonresponse weighting adjustments in two ways. First, estimates from birth certificate data are compared among (1) sample respondents using base weights, (2) sample respondents using final adjusted sampling weights, (3) all sampled cases using base weights, and (4) the full sampling frame. Second, selected survey responses are compared using base weights versus full nonresponse-adjusted weights.

Birth certificate data. Table 39 presents birth certificate data from the National Center for Health Statistics Natality Public-Use Data File using four types of estimates:

1. Weighted means and percentages calculated with base weights using sample respondents;

2. Weighted means and percentages calculated with final sampling weights using sample respondents;

3. Weighted means and percentages calculated with base weights using all sampled cases (respondents and nonrespondents); and

4. Means and percentages using all cases on the sampling frame. These numbers are not weighted.

Several comparisons are possible with these data. First, any differences between columns (3) and (4) are due to sampling variability from selecting the sample of birth certificates. In general these differences are quite small. The only notable differences here relate to size of metropolitan area. The selected sample contained a higher percentage of cases from non-metropolitan areas than are represented on the birth certificate frame, with a correspondingly smaller percentage in metropolitan areas with 250,000 persons or more.

Table 39. Comparison of birth certificate data versus weighted ECLS-B respondents to the parent CAPI instrument, 9-month data collection: 2001–02

Characteristic	(1) Sample respondent estimates using base weights	(2) Sample respondent estimates using final weights	(3) Full sample estimates using base weights	(4) Sampling frame data (unweighted)
Age of mother (years) (Mean)	27.1	27.3	27.3	27.3
Age of father (years) (mean)	30.2	30.3	30.3	30.3
Education of mother (years) (mean)	14.1	14.0	14.0	14.1
Child's race/ethnicity (percent)				
American Indian/Alaska Native	1.4	1.4	1.3	1.4
Chinese	0.5	0.6	0.5	0.6
Other Asian/Pacific Islander	4.9	3.7	5.2	3.7
Hispanic	19.3	20.8	19.8	20.8
Black, non-Hispanic	15.9	14.5	14.8	14.5
White, non-Hispanic	58.1	59.0	58.4	59.0
Birth order (mean)	2.5	2.4	2.5	2.5
Number of prenatal visits (mean)	11.6	11.5	11.5	11.5
Five-minute APGAR score (mean)	8.9	8.9	8.9	8.9
Alcohol use during pregnancy (percent)				
Yes	0.5	0.4	0.6	0.7
No	85.7	84.8	85.5	85.2
Unknown	13.8	14.7	13.9	14.1
Medical risk factors (e.g., anemia, cardiac disease, lung disease, tobacco or alcohol use, weight gain, etc.) (percent)				
None reported	83.4	84.4	83.9	84.4
One or more risk factors reported	16.6	15.6	16.1	15.6

See notes at end of table.

Table 39. Comparison of birth certificate data versus weighted ECLS-B respondents to the parent CAPI instrument, 9-month data collection: 2001–02—Continued

Characteristic	(1) Sample respondent estimates using base weights	(2) Sample respondent estimates using final weights	(3) Full sample estimates using base weights	(4) Sampling frame data (unweighted)
Complications during delivery (percent)				
None reported	79.3	78.9	78.8	78.7
One or more complications reported	20.7	21.1	21.2	21.3
Congenital anomalies (e.g., anancephalus, spina bifida, etc.) (percent)				
None reported	99.0	99.0	98.9	98.7
One or more anomalies reported	1.0	1.0	1.1	1.3
Birth weight (grams) (mean)	3,319	3,317	3,325	3,323
Plurality (percent)				
Single	96.7	96.8	97.0	96.8
Twin	3.1	3.0	2.9	3.0
Triplet	0.1	0.2	0.1	0.2
Quadruplet	0.0	0.0	0.0	0.0
PMSA/MSA[1] population size (percent)				
250,000 or more	68.2	74.2	69.9	74.2
100,000 to 250,000	9.8	7.4	9.2	7.4
100,000 or less	0.6	0.5	0.6	0.5
Non-metropolitan	21.4	17.8	20.1	17.8
Foreign resident	0.1	0.1	0.2	0.1
Census region of residence (percent)				
Foreign resident	0.1	0.1	0.2	0.1
Northeast	15.6	17.0	16.9	17.0
Midwest	22.9	21.9	22.2	21.9
South	37.9	36.7	37.4	36.7
West	23.5	24.2	23.2	24.2

[1]PMSAs (Primary Metropolitan Statistical Areas) are made up of contiguous MSAs (Metropolitan Statistical Areas) of 1,000,000 or more people.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Second, a comparison of columns (1) and (3) provides an estimate of the bias that would result from using uncorrected base weights for estimation. All differences between these estimates are within 1.5 percentage points except for birth weight (6 grams).

Next, comparing columns (1) and (2) shows the degree to which the base weights are modified by the weighting adjustments. The greatest adjustments to the base weights are for size of PMSA and census region.

Finally, comparing columns (2) and (4) indicates the agreement between estimates using the final weights and the birth certificate data on the sampling frame. For data that were used as control totals in raking (see section 4.5), the birth certificate data and final weighted estimates match exactly. Weighting adjustments should also reduce bias for data that are correlated with the control variables. Comparing columns two and four in table 39 shows that differences between the birth certificate data and weighted respondents are negligible (less than 0.7 percent) for all variables shown.

Table 40 repeats the analysis in table 39 for respondents to the father questionnaires. As above, differences between columns (3) and (4) are due to sampling variability from selecting the sample of birth certificates. In general these differences are quite small, except for size of metropolitan area, which has the same pattern as seen above. Second, a comparison of columns (1) and (3) provides an estimate of the bias that would result from using uncorrected base weights for estimation. All differences between these estimates are within 2.3 percent except for birth weight (20 grams), percent of Black, non-Hispanic race/ethnicity (3.0 percent); and percent of White, non-Hispanic race/ethnicity (5.6 percent). Comparing columns (1) and (2) in table 40 shows that the greatest adjustments to the base weights are for race/ethnicity and size of metropolitan area. Finally, comparing columns (2) and (4) indicates the agreement between estimates using the final weights and the birth certificate data on the sampling frame. For data that were used as control totals in raking (see section 4.5), the birth certificate data and final weighted estimates match exactly. Comparing columns two and four in table 40 shows that differences between the birth certificate data and weighted respondents are negligible (less than 2 percent) for all variables shown.

This analysis suggests that the nonresponse and raking adjustments used to construct the final sampling weights seem to reduce potential nonresponse bias for factors for birth certificate data. This should also be true for data that are related to these characteristics.

Survey data. One method for evaluating the effects of nonresponse weighting adjustments consists of comparing weighted estimates that were not adjusted for nonresponse to estimates using weights that were adjusted for nonresponse. As noted in the previous section, the process of nonresponse and raking adjustments reduces bias in estimates for the birth certificate variables used to make the adjustments. There is also an effect of these adjustments on survey variables that are correlated with those used for making adjustments. The comparisons in tables 41 through 47 show the effect of the weighting adjustments on the survey variables. Assuming that the means of respondents and nonrespondents are not much different within the weighting adjustment classes, the difference between base-weighted estimates and final weighted estimates also indicates the magnitude of the bias correction. However, in some circumstances, nonresponse adjustments can actually increase bias (see Thomsen 1973; Brick and Kalton 1996).

Table 41 through 47 gives estimates from the survey data using base weights, final analysis weights, and the difference (adjusted minus unadjusted). Estimates are given for data formed as composites from several sources, and for data taken directly from the parent interview, the child assessment scores, and resident and nonresident father self-administered questionnaires. All differences shown in these tables are small.

In summary, the evaluation of estimates for respondents and nonrespondents indicated some differences, mainly with respect to race/ethnicity, residence in metropolitan areas, and census region of residence. The nonresponse and raking adjustments corrected those differences. The analysis in tables 41 through 47 indicates that these adjustments had little impact on estimates for survey data.

Table 40. Comparison of birth certificate data versus weighted ECLS-B respondents to the father questionnaires, 9-month data collection: 2001–02

Characteristic	(1) Sample respondent estimates using base weights	(2) Sample respondent estimates using final weights	(3) Full sample estimates using base weights	(4) Sampling frame data (unweighted)
Age of mother (years) (mean)	27.8	27.6	27.4	27.3
Age of father (years) (mean)	30.5	30.4	30.3	30.3
Education of mother (years) (mean)	14.2	14.0	14.1	14.1
Child's race/ethnicity (percent)				
American Indian/Alaska Native	1.3	1.3	1.3	1.4
Chinese	0.5	0.6	0.5	0.6
Other Asian/Pacific Islander	4.8	3.9	5.1	3.7
Hispanic	16.9	20.6	19.2	20.8
Black, non-Hispanic	11.0	12.6	14.0	14.5
White, non-Hispanic	65.6	61.0	60.0	59.0
Birth order (mean)	2.4	2.4	2.5	2.5
Number of prenatal visits (mean)	11.8	11.6	11.7	11.5
Five-minute APGAR score (mean)	8.9	8.9	8.9	8.9
Alcohol use during pregnancy (percent)				
Yes	0.4	0.3	0.4	0.7
No	87.8	85.5	85.7	85.2
Unknown	11.8	14.2	13.9	14.0
Medical risk factors (e.g., anemia, cardiac disease, lung disease, tobacco or alcohol use, weight gain, etc.) (percent)				
None reported	83.6	84.6	83.6	84.4
One or more risk factors reported	16.4	15.4	16.4	15.6

See note at end of table.

Table 40. Comparison of birth certificate data versus weighted ECLS-B respondents to the father questionnaires, 9-month data collection: 2001–02—Continued

Characteristic	(1) Sample respondent estimates using base weights	(2) Sample respondent estimates using final weights	(3) Full sample estimates using base weights	(4) Sampling frame data (unweighted)
Complications during delivery (percent)				
None reported	79.0	78.9	79.5	78.7
One or more complications reported	21.0	21.1	20.5	21.3
Congenital anomalies (e.g., anancephalus, spina bifida, etc.) (percent)				
None reported	99.0	99.1	99.0	98.7
One or more anomalies reported	1.0	0.9	1.0	1.3
Birth weight (grams) (mean)	3,350	3,334	3,330	3,323
Plurality (percent)				
Single	96.6	97.1	96.6	96.8
Twin	3.2	2.7	3.2	3.0
Triplet	0.1	0.2	0.1	0.2
Quadruplet	0.0	0.0	0.0	0.0
PMSA/MSA[1] population size (percent)				
250,000 or more	66.1	74.0	68.0	74.2
100,000 to 250,000	10.2	7.4	9.8	7.4
100,000 or less	0.7	0.5	0.6	0.5
Non-metropolitan	22.9	17.9	21.5	17.8
Foreign resident	0.1	0.2	0.1	0.1
Census region of residence (percent)				
Foreign resident	0.1	0.2	0.1	0.1
Northeast	15.2	16.9	15.5	17.0
Midwest	25.1	22.2	23.2	21.9
South	37.8	36.6	37.6	36.7
West	21.8	24.2	23.7	24.2

[1]PMSAs (Primary Metropolitan Statistical Areas) are made up of contiguous MSAs (Metropolitan Statistical Areas) of 1,000,000 or more people.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 41. Comparison of survey data on household characteristics using base weights versus full sample weights, 9-month data collection: 2001–02

Characteristic	Response	Number of cases	Base-weighted	Full sample weighted	Difference
Total		10,688	100.0	100.0	0.0
Parents who reside in the household (percent) (X1HPARNT)	Biological mother and biological father	8,282	77.8	78.5	0.7
	Biological father and other mother	104	1.1	1.1	0.0
	Biological mother and other father	6	0.1	0.1	0.0
	Biological mother only	2,198	20.3	19.6	-0.7
	Biological father only	15	0.1	0.1	0.0
	Two adoptive parents	13	0.1	0.1	0.0
	Single adoptive parent or adoptive and stepparent	7	0.0	0.0	0.0
	Related guardian(s)	49	0.4	0.4	0.0
	Unrelated guardian(s)	14	0.1	0.1	0.0
Household members (percent) (X1HTOTAL)	2	290	2.9	2.9	0.0
	3	2,781	28.7	29.6	0.9
	4	3,299	32.2	31.6	-0.6
	5	2,219	19.4	19.4	0.0
	6	1,125	9.1	9.0	-0.1
	7	533	4.1	4.1	0.0
	8+	441	3.4	3.4	0.0
Household income ($) (X1INCOME)	5,000 or less	591	5.3	5.0	-0.3
	5,001 to 10,000	690	5.8	5.6	-0.2
	10,001 to 15,000	803	7.8	7.6	-0.2
	15,001 to 20,000	791	8.0	7.9	-0.1
	20,001 to 25,000	998	9.6	9.5	-0.1
	25,001 to 30,000	858	7.8	7.8	0.0
	30,001 to 35,000	638	6.4	6.3	-0.1
	35,001 to 40,000	674	6.3	6.2	-0.1
	40,001 to 50,000	928	8.8	8.8	0.0
	50,001 to 75,000	1,565	14.8	15.1	0.3
	75,001 to 100,000	1,010	9.6	10.1	0.5
	100,001 to 200,000	978	8.4	8.8	0.4
	200,001 or more	164	1.3	1.3	0.0

See note at end of table.

Table 41. Comparison of survey data on household characteristics using base weights versus full sample weights, 9-month data collection: 2001–02—Continued

Characteristic	Response	Number of cases	Base-weighted	Full sample weighted	Difference
Poverty status (percent) (X1POVERTY)	Below poverty line	2,603	23.6	22.9	-0.7
	Above poverty line	8,085	76.4	77.1	0.7
Non-English primary language spoken at home? (percent) (X1PRNLNG)	Yes	2,276	17.6	18.7	1.1
	No	8,412	82.4	81.3	-1.1

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 42. Comparison of survey data on parent-reported child characteristics using base weights versus full sample weights, in percent, 9-month data collection: 2001–02

Characteristic	Response	Number of cases	Base-weighted	Full sample weighted	Difference
Status of child health (P1CHEALT)	Excellent	6,251	61.6	61.7	0.1
	Very good	2,950	26.8	26.6	-0.2
	Good	1,139	9.1	9.2	0.1
	Fair	305	2.4	2.4	0.0
	Poor	31	0.1	0.1	0.0
Child demands attention and company (P1ATTN)	Never	2,074	18.8	19.0	0.2
	Used to be	498	4.5	4.5	0.0
	Sometimes	4,036	39.1	39.2	0.1
	Most times	4,074	37.5	37.2	-0.3
Child is fussy or irritable (P1FUSSY)	Never	3,729	36.6	36.9	0.3
	Used to be	743	6.8	6.8	0.0
	Sometimes	5,735	52.5	52.3	-0.2
	Most times	474	4.1	4.0	-0.1
Child needs help to fall asleep (P1HLPSLP)	Never	5,932	56.1	56.2	0.1
	Used to be	953	8.7	8.7	0.0
	Sometimes	2,382	22.3	22.2	-0.1
	Most times	1,413	13.0	12.9	-0.1
Child cries for food or toys (P1NOWAIT)	Never	2,980	27.8	27.9	0.1
	Used to be	467	4.0	4.0	0.0
	Sometimes	5,562	52.5	52.6	0.1
	Most times	1,673	15.7	15.6	-0.1
Child is startled by loud sounds (P1STRTL)	Never	6,027	58.5	58.5	0.0
	Used to be	801	7.5	7.4	-0.1
	Sometimes	2,780	25.0	25.0	0.0
	Most times	1,072	9.0	9.1	0.1
Child wakes up 3 or more times a night (P1WAKES)	Never	7,293	69.9	70.1	0.2
	Used to be	1,710	16.0	15.7	-0.3
	Sometimes	1,262	10.7	10.8	0.1
	Most times	416	3.4	3.4	0.0
Child goes from whimper to crying (P1WHMPR)	Never	4,629	45.7	46.0	0.3
	Used to be	707	6.4	6.3	-0.1
	Sometimes	4,543	41.0	40.8	-0.2
	Most times	803	6.9	7.0	0.1

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 43. Comparison of survey data on parent activities with child using base weights versus full sample weights, in percent, 9-month data collection: 2001–02

Activity	Response	Number of cases	Base-weighted	Full sample weighted	Difference
How often do you read to the child? (P1READBO)	Not at all	1,383	12.0	12.1	0.1
	Once or twice	3,664	33.6	33.2	-0.4
	3 to 6 times	2,421	22.5	22.2	-0.3
	Every day	3,213	32.0	32.5	0.5
How often do you all sing songs? (PSINGSO)	Not at all	237	2.0	2.1	0.1
	Once or twice	1,080	9.8	9.5	-0.3
	3 to 6 times	1,546	14.9	14.9	0.0
	Every day	7,819	73.3	73.5	0.2
How often do you tell child stories? (P1TELLST)	Not at all	2,480	22.3	22.3	0.0
	Once or twice	3,469	32.6	32.4	-0.2
	3 to 6 times	1,930	18.2	18.1	-0.1
	Every day	2,802	27.0	27.2	0.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 44. Comparison of survey data on child assessments using base weights versus full sample weights, in percent, 9-month data collection: 2001–02

Child assessment	Response	Number of cases	Base-weighted	Full sample weighted	Difference
Nursing Child Assessment Teaching Scale (NCATS)					
NCATS – total child score (X1NCATTC)	Mean	8,631	15.5	15.5	0.0
	Standard error	†	0.05	0.05	†
NCATS – total parent score (X1CATTP)	Mean	8,633	34.7	34.7	0.0
	Standard error	†	0.10	0.08	†
NCATS – total score (X1NCATTS)	Mean	8,633	50.2	50.2	0.0
	Standard error	†	0.12	0.10	†
Bayley Short Form–Research Edition (BSF-R)					
Mental score (X1TRUMEN)	Mean	10,174	50.1	50.1	0.0
	Standard error	†	0.23	0.22	†
Motor score (X1TRUMOT)	Mean	10,157	50.2	50.0	-0.2
	Standard error	†	0.18	0.18	†

† Not applicable.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 45. Comparison of survey data on characteristics of fathers using base weights versus full sample weights, in percent, 9-month data collection: 2001–02

Characteristic	Response	Number of cases	Base-weighted	Full sample weighted	Difference
Type of resident father-birth/adopted/step/foster (X1FTHTYP)	Birth father	8,303	98.4	98.3	-0.1
	Adoptive father	16	0.1	0.2	0.1
	Stepfather	26	0.4	0.4	0.0
	Foster father	7	0.1	0.1	0.0
	Partner father	75	1.0	1.0	0.0
Resident father's highest education level (X1FTHED)	8th grade or below	463	6.4	6.8	0.4
	9th to 12th grade	1,263	15.0	14.8	-0.2
	High school diploma/ equivalent	1,872	23.5	22.9	-0.6
	Voc/tec program	336	4.1	4.2	0.1
	Some college	1,793	22.1	21.9	-0.2
	Bachelor's degree	1,429	16.7	17.1	0.4
	Graduate professional school/no degree	179	2.3	2.3	0.0
	Masters degree	644	6.1	6.2	0.1
	Doctorate or professional degree	448	3.8	3.7	-0.1
Resident father/male guardian's work status (X1HFEMP)	35 hours or more per week	6,906	86.1	86.3	0.2
	Less than 35 hours per week	410	4.9	4.7	-0.2
	Looking for work	319	3.6	3.5	-0.1
	Not in the labor force	491	5.5	5.4	-0.1
Nonresident father's highest education level (X1NRFED)	8th grade or below	104	5.7	6.2	0.5
	9th to 12th grade	752	37.8	38.0	0.2
	High school diploma/ equivalent	734	36.5	35.5	-1.0
	Voc/tec program	35	1.5	1.5	0.0
	Some college	292	14.3	14.1	-0.2
	Bachelor's degree	61	2.4	2.6	0.2
	Graduate professional school/no degree	8	0.3	0.3	0.0
	Masters degree	12	0.7	0.7	0.0
	Doctorate or professional degree	11	0.8	1.0	0.2

See note at end of table.

Table 45. Comparison of survey data on characteristics of fathers using base weights versus full sample weights, in percent, 9-month data collection: 2001–02—Continued

Characteristic	Response	Number of cases	Base-weighted	Full sample weighted	Difference
Nonresident father's work status (X1NRFEMP)	35 hours or more per week	363	60.1	60.6	0.5
	Less than 35 hours per week	84	14.3	14.3	0.0
	Looking for work	93	14.1	13.6	-0.5
	Not in the labor force	83	11.4	11.6	0.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 46. Comparison of survey data on involvement of biological father in pregnancy and birth using base weights versus full sample father weights, in percent, 9-month data collection: 2001–02

Item	Response	Number of responses	Base-weighted	Full sample weighted	Difference
Did she become pregnant sooner/later than father wanted? (N1FPGTMG)	Sooner	188	51.7	51.6	-0.1
	Later	27	10.0	10.0	0.0
	About the right time	143	38.2	38.4	0.2
Father's involvement in pregnancy: discuss with partner (F1DCSPRG)	Yes	5,658	92.9	92.7	-0.2
	No	437	7.1	7.3	0.2
Father's involvement in pregnancy: see sonogram or ultrasound of baby (F1SONGRM)	Yes	5,819	95.7	95.6	-0.1
	No	276	4.3	4.4	0.1
Father's involvement in pregnancy: listen to baby's heartbeat (F1BBYHRT)	Yes	5,688	93.7	93.7	0.0
	No	410	6.3	6.3	0.0
Father's involvement in pregnancy: feel the baby move (F1BBYMVE)	Yes	5,934	98.3	98.3	0.0
	No	159	1.7	1.7	0.0
Father's involvement in pregnancy: attend childbirth classes/ Lamaze with mother (F1ATLMZE)	Yes	2,528	43.6	44.4	0.8
	No	3,564	56.4	55.6	-0.8
Father's involvement in pregnancy: buy things for child (F1BUYFCH)	Yes	5,529	90.6	90.6	0.0
	No	573	9.4	9.4	0.0

See note at end of table.

Table 46. Comparison of survey data on involvement of biological father in pregnancy and birth using base weights versus full sample father weights, in percent, 9-month data collection: 2001–02—Continued

Item	Response	Number of responses	Base-weighted	Full sample weighted	Difference
Father in delivery room? ((F1DLVYRM)	Yes	5,690	94.8	94.8	0.0
	No	430	5.2	5.2	0.0
When father first held child (N1HLD1CH)	Within an hour after delivery	354	57.7	57.4	-0.3
	The day of birth but more than an hour after delivery	92	16.9	16.6	-0.3
	one day after birth	47	7.1	7.0	-0.1
	2-3 days after birth	28	4.6	4.7	0.1
	4-7 days after birth	9	0.9	1.1	0.2
	8-14 days after birth	14	2.3	2.2	-0.1
	15 or more days after birth	50	7.3	7.6	0.3
	Could not hold child because in NICU	71	3.3	3.5	0.2
Father visit mother in hospital after birth (F1SEEBBY)	Yes	6,007	98.3	98.3	0.0
	No	54	0.8	0.8	0.0
	Child never in hospital or birthing center	54	0.9	0.9	0.0

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Table 47. Comparison of survey data on resident father activities in a typical week using base weights versus full sample father weights, in percent, 9-month data collection: 2001–02

Item	Response	Number of cases	Base-weighted	Full sample weighted	Difference
In typical week, does resident father read to child (F1READBK)	Not at all	1,775	27.4	27.3	-0.1
	Once or twice	2,765	46.0	45.8	-0.2
	3 to 6 times	1,088	18.3	18.4	0.1
	Everyday	517	8.3	8.4	0.1
In typical week, does resident father tell stories to child (F1TLSTRY)	Not at all	1,875	29.5	29.4	-0.1
	Once or twice	2,538	43.4	43.4	0.0
	3 to 6 times	999	16.9	16.9	0.0
	Everyday	666	10.3	10.4	0.1
In typical week, does resident father sing songs to child (F1SINGS)	Not at all	772	11.9	11.5	-0.4
	Once or twice	1,681	28.9	28.8	-0.1
	3 to 6 times	1,499	25.1	25.1	0.0
	Everyday	2,127	34.2	34.7	0.5
In typical week, does resident father take child on errands (F1TAKECH)	Not at all	734	9.9	10.0	0.1
	Once or twice	2,266	36.0	36.5	0.5
	3 to 6 times	1,738	30.4	30.3	-0.1
	Everyday	1,439	23.7	23.2	-0.5

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

5.4 Conclusions

This chapter presents an evaluation of potential nonresponse bias in ECLS-B survey estimates based on response rates and the assessment of differences between respondents and nonrespondents. With respect to response rates, the weighted PSU response rate was 90.9 percent. At this level of response, there is little potential for nonresponse bias. In the parent questionnaire, the overall unconditional response rate was 74.1 percent, ranging from 63.2 to 80.7 percent by domain, after substitution; before substitution, the overall response rate was 67.9, ranging from 57.7 to 74.0 percent. In the child assessments, the overall unconditional response rate was 65.0 before and 70.9 percent after substitution; in the father questionnaires, the overall unconditional response rate was 50.0 percent before and 54.3 percent after substitution. However, even at these response rate levels, the comparison of frame data between respondents and nonrespondents showed very small differences that would be unlikely to result in nonresponse bias. The greatest differences were for race/ethnicity and size of metropolitan area, both of which were addressed in weighting adjustments through raking. In summary, these analyses indicate little evidence of nonresponse bias. Moreover, the few differences that are evident have been corrected though adjustments to sampling weights.

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6. COMPARISON OF ECLS-B DATA WITH OTHER SURVEYS

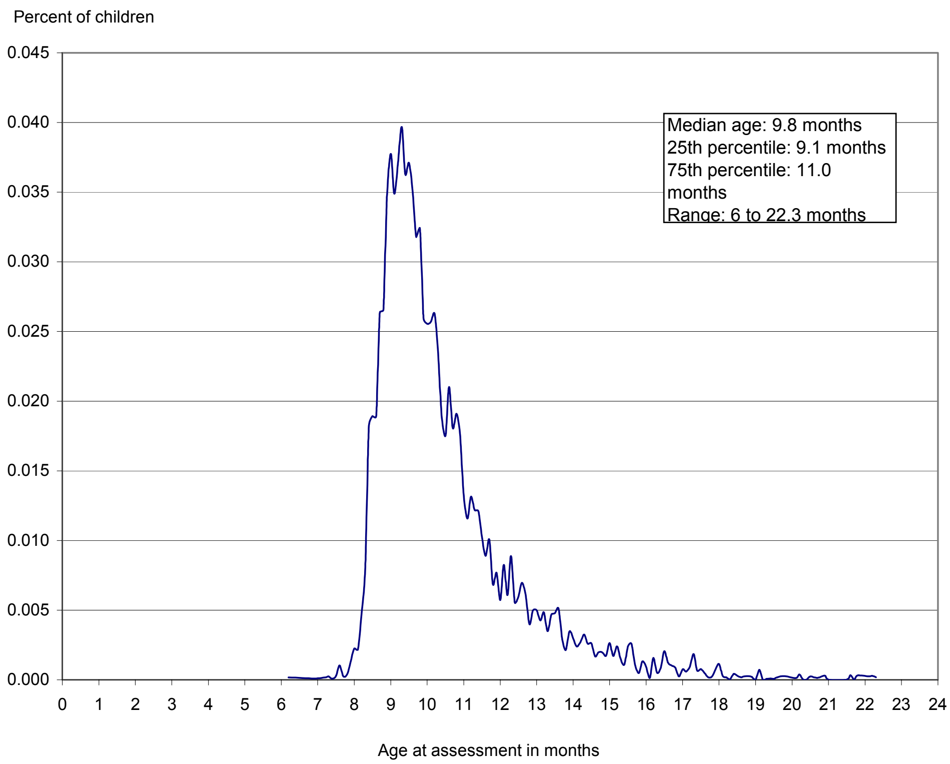
6.1 Overview

The purpose of this chapter is to compare survey data collected in the ECLS-B with similar data collected in other surveys. Since many questions in the ECLS-B were drawn from other surveys, the items in many cases will have identical wording These are intended only as rough comparisons, since there are many reasons that data collected in two different surveys may differ, even if the questions were worded in the same way.

Results from two surveys can differ because of differences in the populations surveyed, in question context or wording, in mode of data collection, and in the time period during which the survey was conducted. Furthermore, all surveys suffer from many sources of nonsampling error, including response errors, processing errors, nonresponse, and noncoverage. In comparing ECLS-B results and the results from other surveys, this chapter attempts to assess the differences in terms of the many sources of error for both surveys and in the differences in concepts and populations between the surveys.

Besides these general difficulties in comparing surveys, there are specific problems in comparing ECLS-B estimates with estimates from other surveys. The ECLS-B is a nationally representative sample of births in 2001. Many of the characteristics of the families, households, and children surveyed in the ECLS-B are dependent on the fact that a recent birth has occurred. For example, families are more likely to use child care for older children than for infants, for whom the mother is more likely to stay at home. This affects not only child care but also whether the mother worked for pay. The first round of the ECLS-B was intended to survey families at about the time that the sampled child (or children, in the case of twins) turned 9 months of age. As a result, the ages of the children surveyed in the ECLS-B is clustered about the age of 10 months, with half the assessments being done between the ages of 9 and 11 months. The distribution of ages of children in ECLS-B at this round of data collection is shown in figure 1. In most household surveys, the ages of children are evenly distributed by month of age, not clustered about a midpoint as in ECLS-B. Since many of the ECLS-B measures are time dependent, this unusual distribution of ages makes many of the comparisons with other surveys problematic.

Figure 1. Child's age at assessment, 9-month data collection: 2001–02



NOTE: This figure and the accompanying statistics were calculated using the ECLS-B final analysis weights.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

This section will compare ECLS-B data with the following sources:

- National Household Education Surveys Program (NHES);
- National Health Interview Survey (NHIS);
- Current Population Survey (CPS) Food Security Supplement;
- Child Development Inventory (CDI);
- American Community Survey (ACS);
- Early Head Start Study of Fathers of Newborns; and
- Fragile Families and Child Wellbeing Study.

These comparisons are discussed in sections 6.2 to 6.8. All of these comparisons (with the exception of the CDI) are based on large government-sponsored surveys with high standards of data quality. Furthermore, many of the items in the ECLS-B were drawn or adapted from items found in these surveys. Nonetheless, caution must be used in evaluating differences—or similarities—between surveys.

6.2 National Household Education Surveys Program

The NHES conducts telephone surveys of the civilian noninstitutionalized population of the United States. The Early Childhood Program Participation Survey (ECPP-NHES) is one of the primary components of NHES and represents children from birth through age 10 in the third grade or below, depending on the data collection year. The ECPP includes questions on children's participation in formal and informal nonparent care and education programs, including relative care, nonrelative care, center-based care, as well as on characteristics of care arrangements.

The ECPP was conducted in 1991, 1995, and 2001, with a subset of questions also asked in 1999. Several ECLS-B items relating to relative care were taken directly from the ECPP. This section compares the ECLS-B and ECPP for 2001, using data from the ECPP public-use file. The response rate for the 2001 ECPP was 59.9 percent. Since the ECPP is conducted solely by telephone, households without telephones are not surveyed; moreover, households with cell phones but no landline telephone (currently estimated to be 4.9 percent by the CPS) would not be surveyed. The post-stratification control totals for the 2001 ECPP included region and whether children under 18 were present in the household (*NHES: 2001 Data File User's Manual*).

The ECPP data for these comparisons are limited to households with children aged 0 to 24 months to make them more comparable to children in the ECLS-B at the time of their 9-month interview. The impact of this restriction is to reduce the ECPP sample size from 6,749 to 2,328 children. In addition, NHES estimates are given for the subset of households with children aged 8–12 months; this group is closer in age to the ECLS-B sample (figure 1), but the effect of this restriction is to reduce the sample size to 430 children.

Table 48 gives comparisons between ECLS-B and ECPP-NHES data on race/ethnicity, child care arrangements, living arrangements, language spoken at home, parent's education, and father's employment. The ECLS-B data use the nonresponse-adjusted, raked replicate weights (W1R1-W1R90); the ECPP-NHES data use the nonresponse-adjusted, raked replicate weights for NHES. The two data sets were combined for analysis, and significance tests were done in WesVar to reflect the sample designs of each survey while also reflecting the independence of the two surveys. The significance tests are based on comparing the ECLS-B data with NHES estimates for households with children aged 0 to 24 months. Estimates for the 8–12 month age group are also reported, but no significance tests were done for this group because of the small sample sizes.

Many of the differences shown in table 49 are significant, with some differences that are substantial in magnitude. There are several differences relating to child care (from a relative, from a non-relative or center-based), though these are apparently due to the differences in age, since the 8–12 month NHES data yield estimates that are closer to the ELCS-B estimates. Mothers in NHES reported their marital status as "married" 7.6 percent more frequently than mothers in the ECLS-B, who reported 6.6 percent more often as "never married." This difference is reflected in estimates for households that have 0–24 month-old children. There are also differences between ECLS-B and NHES estimates, for both mother's and father's primary language, father's employment, father's education, and mother's education, with mothers in NHES reporting fewer high school graduates (though more college graduates) than mothers in ECLS-B (p = 0.022) for this comparison. Finally, race/ethnicity of the child was indicated to be "White, non-Hispanic" more frequently in NHES than in the ECLS-B (p = 0.000), and, *concordantly*, Hispanic less frequently. However; the NHES has a greater percentage of Spanish-speaking mothers, which seems somewhat contradictory. For the most part these differences are similar for both sets of estimates (i.e., households with 0–24 month-old children and households with 8–12 month-old children), and thus do not appear to be sensitive to the age of the child. Some of these differences could be due to the mode of data collection, which was conducted by in-person interview in the ECLS-B but by telephone in NHES. For example, households headed by single females are less likely to have telephones than households with married couples, and households without telephones tend to have lower income, to rent rather than own, and to have a younger head of household (Brunink et al. 1999).

Thus, while there are some differences between ECLS-B and NHES estimates, they are likely due to differences in the population surveyed and in the mode of data collection.

Table 48. Comparison of Early Childhood Program Participation Survey of the National Household Education Surveys Program (ECPP-NHES) and ECLS-B child and family data, 9-month data collection: 2001–02

Characteristic	NHES: Age 8-12 mos.	NHES: Age 0-24 mos.	ECLS-B	Difference[1]	Degree of freedom	t / χ^2	p-value	Sample size[2]: NHES	Sample size[2]: ECLS-B
Race/ethnicity of the child (percent)									
White, non-Hispanic	58.6	60.4	53.5	6.9	3	69.2	0.000	1,319	4,441
Black, non-Hispanic	15.2	14.8	13.7	1.1	§	§	§	292	1,698
Hispanic	20.1	18.7	25.5	-6.8	§	§	§	578	2,193
Other race/ethnicity	6.1	6.0	7.2	-1.2	§	§	§	139	2,317
					§	§	§		
Receives care from a relative? (percent)									
Yes	26.7	23.0	28.7	-5.7	1	28.9	0.000	557	3171
No	73.3	77.0	71.3	5.7	§	§	§	1,771	7508
Ever received care from a relative? (percent)									
Yes	6.7	8.9	9.0	-0.1	1	0.0	0.958	147	779
No	66.6	68.1	62.3	5.8	§	§	§	1,624	6,729
Not applicable	26.7	23.0	28.7	†	§	§	§	†	†
Relative who cares for child (percent)									
Grandparents	75.9	76.9	73.3	3.6	5	15.4	0.909	430	2,370
Aunt	12.2	13.9	16.7	-2.8	§	§	§	77	484
Other relative	11.9	9.2	10.0	0.8	§	§	§	50	317

See notes at end of table.

Table 48. Comparison of Early Childhood Program Participation Survey of the National Household Education Surveys Program (ECPP-NHES) and ECLS-B child and family data, 9-month data collection: 2001–02—Continued

	NHES							Sample size[2]	
Characteristic	Age 8-12 mos.	Age 0-24 mos.	ECLS-B	Difference[1]	Degree of freedom	t / χ^2	p-value	NHES	ECLS-B
Language spoken most by relative (percent)									
English	78.7	83.3	74.3	9.0	2	23.9	0.000	428	2,221
Spanish	9.8	9.9	18.3	-8.4	§	§	§	79	383
Other language	11.5	6.9	7.4	-0.5	§	§	§	33	567
Location of relative care (percent)									
Own home	36.2	34.3	42.7	-8.4	2	11.9	0.003	213	1,486
Other home	61.1	59.7	50.9	8.8	§	§	§	313	1,495
Both/varies	2.7	6.0	6.4	-0.4	§	§	§	31	189
Any fee for relative care (percent)									
Yes	30.7	29.9	26.7	3.2	1	1.5	0.226	157	828
No	69.3	70.1	73.3	-3.2	§	§	§	383	2,339
Number of days per week receives relative care									
Mean	3.7	3.7	3.9	-0.2	†	2.76	0.003	528	3,164
Standard error	0.21	0.075	0.046	†	†	§	§	†	†

See notes at end of table.

Table 48. Comparison of Early Childhood Program Participation Survey of the National Household Education Surveys Program (ECPP-NHES) and ECLS-B child and family data, 9-month data collection: 2001–02—Continued

	NHES							Sample size[2]	
Characteristic	Age 8-12 mos.	Age 0-24 mos.	ECLS-B	Difference[1]	Degree of Freedom	t / χ^2	p-value	NHES	ECLS-B
Receives care from a nonrelative? (percent)									
Yes	19.1	17.6	16.6	1.0	1	1.1	0.298	430	1,724
No	80.9	82.4	83.4	-1.0	§	§	§	1,898	8,956
Ever received care from a nonrelative? (percent)									
Yes	3.5	6.2	4.9	1.3	1	3.7	0.055	120	399
No	77.4	76.2	78.5	-2.3	§	§	§	1,778	8,557
Not applicable	19.1	17.6	16.6	†	§	§	§	430	1,724
Location of nonrelative care (percent)									
Own home	16.8	19.9	20.9	-1.0	2	0.3	0.864	87	480
Other home	82.1	78.9	78.1	0.8	§	§	§	336	1,225
Both/varies	1.1	1.3	1.0	0.3	§	§	§	7	18
Any fee for nonrelative care? (percent)									
Yes	92.2	90.9	92.0	-1.1	1	0.3	0.576	382	1,574
No	7.8	9.1	8.0	1.1	§	§	§	40	147

See notes at end of table.

Table 48. Comparison of Early Childhood Program Participation Survey of the National Household Education Surveys Program (ECPP-NHES) and ECLS-B child and family data, 9-month data collection: 2001–02—Continued

Characteristic	NHES Age 8-12 mos.	NHES Age 0-24 mos.	ECLS-B	Difference[1]	Degree of freedom	t / χ^2	p-value	Sample size[2] NHES	Sample size[2] ECLS-B
Number of days per week receives nonrelative care									
Mean	3.9	3.8	4.0	-0.2	†	1.53	0.120	417	1,718
Standard error	0.66	0.092	0.005	†	†	§	§		
Child attends center-based program? (percent)									
Yes	9.7	11.9	9.4	2.5	1	17.5	0.011	289	950
No	90.3	88.1	90.6	-2.5	§	§	§	2,039	9,728
Child ever attended center-based program? (percent)									
Yes	3.4	5.0	2.8	2.2	1	9.7	0.002	98	283
No	86.9	83.1	87.8	-4.7	§	§	§	1,941	9,445
Not applicable	9.7	11.9	9.4	†	§	§	§	289	950
Any fee for center-based program? (percent)									
Yes	88.8	92.3	88.0	4.3	1	2.5	0.117	268	818
No	11.2	7.7	12.0	-4.3	§	§	§	19	131

See notes at end of table.

Table 48. Comparison of Early Childhood Program Participation Survey of the National Household Education Surveys Program (ECPP-NHES) and ECLS-B child and family data, 9-month data collection: 2001–02—Continued

Characteristic	NHES: Age 8-12 mos.	NHES: Age 0-24 mos.	ECLS-B	Difference[1]	Degree of freedom	t / χ^2	p-value	Sample size[2]: NHES	Sample size[2]: ECLS-B
Number of days per week attended center-based program									
Mean	4.3	4.2	4.4	-0.2	†	1.84	0.066	286	948
Standard error	0.83	0.097	0.049	†	†	§	§	†	†
Child has deafness or hearing problem? (percent)									
Yes	0.0	0.3	0.6	-0.3	1	3.5	0.061	8	96
No	100.0	99.7	99.4	0.3	§	§	§	2,320	10,578
Child has blindness or visual problem (percent)									
Yes	0.1	0.3	0.3	0.0	1	0.0	0.973	9	47
No	99.9	99.7	99.7	0.0	§	§	§	2,319	10,627
Mother's marital status (percent)									
Married	75.0	74.2	66.6	7.6	5	46.3	0.000	1,739	6,924
Separated	3.6	2.4	2.8	-0.4	§	§	§	56	290
Divorced	2.2	3.4	3.8	-0.4	§	§	§	70	360
Widowed	0.0	0.2	0.3	-0.1	§	§	§	6	29
Never been married	19.2	19.9	26.5	-6.6	§	§	§	433	2,943
Mother's primary language (percent)									
English	79.1	81.1	82.8	-1.7	2	70.6	0.000	1,785	8,412
Spanish	13.3	12.3	6.8	5.5	§	§	§	372	696
Other language	7.6	6.6	10.4	-3.8	§	§	§	147	1,020

See notes at end of table.

Table 48. Comparison of Early Childhood Program Participation Survey of the National Household Education Surveys Program (ECPP-NHES) and ECLS-B child and family data, 9-month data collection: 2001–02—Continued

Characteristic	NHES Age 8-12 mos.	NHES Age 0-24 mos.	ECLS-B	Difference[1]	Degree of freedom	t / χ^2	*p*-value	Sample size[2] NHES	Sample size[2] ECLS-B
Mother's highest education level (percent)									
8th grade or below	6.0	3.7	6.1	-2.4	8	160.2	0.000	103	549
9th to 12th grade	11.0	11.2	21.4	-10.2	§	§	§	246	2,258
High school diploma/equivalent	23.9	24.8	21.8	3.0	§	§	§	548	2,277
Voc/tec program	3.4	3.1	2.2	0.9	§	§	§	77	224
Some college	24.8	26.5	24.1	2.4	§	§	§	596	2,497
Bachelor's degree	18.9	19.9	15.4	4.5	§	§	§	473	1,688
Graduate prof. school/no degree	2.0	1.8	1.8	0.0	§	§	§	50	182
Masters degree	8.0	7.6	5.6	2.0	§	§	§	178	687
Doctorate or professional degree	2.0	1.3	1.7	-0.4	§	§	§	33	257
Resident father's primary language spoken (percent)									
English	88.8	89.0	80.5	8.5	3	121.5	0.000	1,670	4,725
Spanish	8.5	8.8	11.3	-2.5	§	§	§	216	516
Both English and Spanish equally	1.9	1.4	3.2	-1.8	§	§	§	37	152
Other language	0.9	0.8	4.9	-4.1	§	§	§	16	768

See notes at end of table.

Table 48. Comparison of Early Childhood Program Participation Survey of the National Household Education Surveys Program (ECPP-NHES) and ECLS-B child and family data, 9-month data collection: 2001–02—Continued

Characteristic	NHES Age 8-12 mos.	NHES Age 0-24 mos.	ECLS-B	Difference[1]	Degree of freedom	t / χ^2	p-value	Sample size[2] NHES	Sample size[2] ECLS-B
Resident father's highest education level (percent)									
8th grade or below	4.4	4.1	6.8	-2.7	8	97.5	0.000	83	463
9th to 12th grade	11.6	10.1	14.8	-4.7		§	§	202	1,263
High school diploma/equivalent	26.7	26.4	22.9	3.5	§	§	§	500	1,872
Voc/tec program	2.1	4.2	4.2	0.0	§	§	§	80	336
Some college	18.0	19.3	21.9	-2.6	§	§	§	385	1,793
Bachelor's degree	23.0	21.7	17.1	4.6	§	§	§	431	1,429
Graduate professional school/no degree	4.0	4.4	2.3	2.1	§	§	§	75	179
Masters degree	8.2	8.1	6.2	1.9	§	§	§	146	644
Doctorate or professional degree	2.1	1.7	3.8	-2.1	§	§	§	37	448
Resident father worked for pay last week? (percent)									
Yes	94.3	93.5	89.3	4.2	2	36.6	0.000	1,824	5,445
No	5.5	6.2	10.7	-4.5	†	§	§	108	746

† Not applicable.

§ Degrees of freedom, χ^2 value, and p-value apply to all levels of the variable shown at left.

[1] "Difference" refers to the difference between the ECLS-B and the NHES 0–24-month data.

[2] Sample size for the NHES data refers to the 0–24-month data.

NOTE: The NHES data were subset to children aged 0 to 24 months for this comparison.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

6.3 National Health Interview Survey

The National Health Interview Survey (NHIS) is conducted annually by the National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC). The NHIS administers face-to-face interviews in a nationally representative sample of households. Each week a probability sample of the civilian noninstitutionalized population of the United States is interviewed by personnel of the U.S. Bureau of the Census. Information is obtained about the health and other characteristics of each member of the household.

Using data published from the 1999 NHIS, this section compares ECLS-B and NHIS estimates for asthma, health insurance coverage, and place of routine medical care.. Comparisons are based on standard errors reported by NCHS (1999), with significance values calculated as two-sample comparisons based on *z*-scores. Since the NHIS is representative of the U.S. population, estimates are reported for the subset of ages from 0 to 4 years, that being the most comparable age group in published estimates. Since the age of most children at time of the ECLS-B 9 month assessment is between 8 and 12 months, an age range of 8-13 or even 0-12 months would have been preferable. By including children aged 2, 3, and 4 years, there may be critical differences between the two populations.[1]

Table 49 presents data from both surveys. Nearly all differences are statistically significant. Respondents on the ECLS-B were less likely to report ever having had asthma than respondents in the NHIS (5.3 versus 7.0 percent). However, this result is expected because of the longer reporting period for the older children in the NHIS. While both ECLS-B and NHIS respondents reported "doctor's office" and "clinic" as the most likely places for usual health care, ECLS-B respondents were more likely to use clinics than NHIS respondents (25.0 percent on ECLS-B versus 20.6 percent on NHIS) and correspondingly less likely to report using doctors or HMOs. There is also a difference between the two surveys in the proportion reporting health insurance coverage, which is 89.8 percent in NHIS but 95.9 percent in the ECLS-B.

Since both surveys were done in person and are nationally representative, it is not clear why the results should differ with respect to these results. The response rate for the NHIS for 1999 (the year from which these data are taken) was 78 percent, only 4 percentage points better than the ECLS-B. Thus nonresponse bias could potentially be of the same magnitude in the NHIS and ECLS-B. However, it is

[1] NHIS data in the public-use file did not contain adequate documentation to generate replicates for variance calculations; published data were used instead.

Table 49. Comparison of 1999 National Household Interview Survey (NHIS) 0–4 year-olds and ECLS-B data on child health, 9-month data collection: 2001-02

Characteristic	NHIS[1]		ECLS-B				
	Estimate	Standard error	Estimate	Standard error	Difference	*z*-score	*p*-value
Ever told that the child has asthma? (percent yes)	7.0	0.48	5.3	0.32	1.7	2.95	0.00
Is the child covered by health insurance? (percent yes)	89.8	0.59	95.9	0.28	-6.1	-9.34	0.00
Place for routine medical care? (percent)							
Clinic or health center	20.6	0.89	25.0	1.04	-4.4	-3.21	0.00
Doctor's office or HMO	72.8	0.93	68.0	1.10	4.8	3.33	0.00
Hospital emergency room	0.3	0.11	0.8	0.12	-0.5	-3.07	0.00
Hospital outpatient department	1.8	0.28	2.0	0.22	-0.2	-0.56	0.62
Some other place	0.5	0.15	0.3	0.07	0.2	1.21	0.28
Does not go to one place most often	3.9	0.40	3.8	0.32	0.1	0.20	0.85

[1] Responses for children aged 0-4 years.

SOURCE: Summary Health Statistics for US Children: National Health Interview Survey, 1999; *Vital and Health Statistics, Series 10, Number 210*, July 2003; and U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

possible that the differences are due to the ages of children, since the NHIS estimate probably includes families with children older than those surveyed in the ECLS-B. While it is not clear how this factor would influence insurance coverage or place of medical care, this difference is a potential cause of the discrepancy between these numbers. There is the further difference in a time period, since the data reported for NHIS are based on the 1999 survey and the ECLS-B data were collected in 2001-2002. All NHES data were collected over a 3-4 month period in the spring of the year and ECLS-B data were collected over a 15-month period (October 2001 through December 2002).

6.4 Current Population Survey Food Security Supplement

The Current Population Survey Food Security Supplement (CPS-FSS) is the source of national and state-level statistics on food insecurity and hunger that are used in U.S. Department of Agriculture's annual reports on household food security. The CPS is a monthly labor force survey of about 56,000 households conducted by the U.S. Census Bureau for the Bureau of Labor Statistics (Bureau of Labor Statistics and Census Bureau 2002), using face-to-face interviews. Once each year, after answering the labor force questions, the same households are asked a series of questions (the Food Security Supplement) about food security, food expenditures, and use of food and nutrition assistance programs. Food security data have been collected by the CPS-FSS each year since 1995. Estimates based on data from 2000–02 are used in the comparison with ECLS-B estimates. The 2001 Food Security Supplement in the CPS had a response rate of 78 percent in 2001 (U.S. Census Bureau 2002).

In the ECLS-B, the food security status of the children's families was assessed based on responses in the 9-month parent CAPI instrument to the 18 food security questions taken from the Food Security Supplement. The questions measured a wide range of food insecurity and reduced food intake issues. Composites were created based on three scales calculated from these responses: Household Food Security Scale, Adult Food Security Scale, and Children's Food Security Scale. Calculations of the Household Food Security Scale composites and the Adult Food Security Scale composites were carried out in accordance with the standard methods described in *Guide to Measuring Household Food Security, Revised 2000* (U.S. Department of Agriculture, Food and Nutrition Service, 2000). Food security scales were calculated for all household members (based on both adult-referenced and child-referenced questions), for adults, and for children. The categorical measure of Household Food Security status provides three ordered categories: food secure, food insecure without hunger, and food insecure with hunger. The categorized measures were compared between the ECLS-B and CPS-FSS.

To compare the ECLS-B and CPS data, food security statistics were run for households with children less than one year of age in the CPS Food Security Supplements for September 2000, April 2001, December 2001, and December 2002. (Note: Only single years of age are available on the CPS.) By drawing on 4 data collection waves in 3 years, the number of cases is about 5,300; for 2002 only, there are about 1,500 cases with children aged less than 1 year.[2] Standard errors for the CPS data were calculated by making a design effect adjustment to simple random sampling variances.[3] Statistical significance was calculated based on two-sample tests for proportions, using complex survey estimates for standard errors of the proportions.

Table 50 gives comparisons between the ECLS-B and the CPS Food Security Supplement for food security among adults and children.[4] The ECLS-B estimates show 3 percent more households with food security among adults than the 2000–02 CPS estimates, a relatively small difference but one that is statistically significant; the difference for the 2002 CPS estimate is smaller, but the difference between the 2002 CPS and ECLS-B estimates is still significant. The difference in estimates for food insecurity for adults (with or without hunger) is about 4 percentage points. This difference is large relative to the estimated proportion of persons with food insecurity, and it is statistically significant as well. The differences between the two surveys are not statistically significant for food insecurity with hunger among either adults or children.

To summarize, the differences in food security among adults are relatively small; the differences in food insecurity with hunger are negligible.

[2] Mark Nord at the Economic Research Service of the U.S. Department of Agriculture calculated these statistics for this report.

[3] This approach was suggested by Mark Nord.

[4] The estimates of the age at which children reach developmental milestones differ by about one month from those presented in *Volume 1: Psychometric Characteristics* of this report. The approach taken in Volume 1 was to delete children who have not yet reached a target milestone from the descriptive statistics; as a result, the mean ages at which children reached each milestone are probably underestimated. The mean ages presented in this report are about a half a month to one month older than the ages presented in *Volume 1: Psychometric Characteristics*. The difference is due to the fact that *Volume 2: Sampling* uses survival analysis, which includes children who have not yet reached a given milestone.

Table 50. Comparison of Current Population Survey (CPS) Food Security Supplement and ECLS-B data on food security, 9-month data collection: 2001–02

Category	CPS Food Security Supplement				ECLS-B		p-value	
	2000–02		2002 only					
	Percent	Standard error	Percent	Standard error	Percent	Standard error	ECLS-B vs. 2000-02	ECLS-B vs. 2002 only
Adult food security status								
Food secure	85.3	0.62	86.7	1.11	89.7	0.53	0.000	0.015
Food insecure (with or without hunger)	14.7	0.62	13.3	1.11	10.3	0.53	0.000	0.015
Food insecure with hunger	3.8	0.33	3.3	0.58	3.0	0.26	0.058	0.639
Child food security status								
Food secure or food insecure without hunger among children	99.8	0.08	99.6	0.21	99.7	0.07	0.339	0.646
Food insecure with hunger among children	0.2	0.08	0.4	0.21	0.3	0.07	0.339	0.646

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort, (ECLS-B), Nine-Month Data Collection, 2001–02.

6.5 Child Development Inventory

The ECLS-B 9-month parent interview included items that provide information about the age at which children reached certain key developmental milestones. Very early or extremely late attainment of key developmental milestones may be associated with latent intellectual giftedness or developmental abnormalities, and may be influenced by the child's environment or other factors. Some of these items were taken from the Child Development Inventory (CDI; Ireton 1992). The CDI is a series of questions for parents that can be used to assess child development. Using paper and pencil forms, parents are asked whether the child is currently able to perform certain activities, such as walk without help or button a button. Because the intent for the ECLS-B was to know the ages at which children achieved certain milestones, the emphasis of the items was changed from whether the child could do the activity currently to the age at which the child first became able to do the activity. These ages are then compared with the norms established by Ireton at which 75 percent of all children could perform these activities. The norms were developed in clinical populations and are not well-documented.

Table 51 gives data comparing ECLS-B child development data with the CDI. The second column of table 51 gives the 75th percentiles of ages reported by Ireton, while the third column gives the same data estimated using a weighted Kaplan-Meier method with ECLS-B data. Since Ireton did not report standard errors, the norms he cited are compared to 95 percent confidence intervals for ECLS-B estimates.

For the four developmental milestones that are comparable to Ireton's measures, the ECLS-B compares closely with the CDI, meaning that the CDI norms fall within (or very nearly within) the 95 percent ECLS-B confidence intervals. Given the major differences in data collection procedures (including clinical populations used for the CDI), little can be made of these comparisons.

Table 51. Comparison of Child Development Inventory (CDI) data and ECLS-B data on child development, 9-month data collection: 2001–02

Milestone	Age when milestone achieved (months) CDI	ECLS-B	ECLS-B standard errors and confidence intervals: Standard error	95 percent lower confidence interval	95 percent upper confidence interval
Sit alone, steady without support[1]	7	7	0.09	6.8	7.2
Crawl on hands and knees[2]	9	8	0.47	7.1	8.9
Pull him/herself to standing position[3]	9	9	0.38	8.3	9.7
Walk holding onto something[4]	10	9	0.56	7.9	10.1

[1] How old was [CHILD/TWIN] in months when [he/she] started to...Sit alone, steady, without support?
[2] How old was [CHILD/TWIN] in months when [he/she] started to... Crawl on hands and knees?
[3] How old was [CHILD/TWIN] in months when [he/she] started to... Pull [him/her]self to a standing position?
[4] How old was [CHILD/TWIN] in months when [he/she] started to... First walk while holding on to something such as furniture?
SOURCE: Ireton (1992) and U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort, (ECLS-B) Nine-Month Data Collection, 2001–02.

6.6 American Community Survey

The American Community Survey (ACS) is conducted by the Census Bureau on a monthly basis. The survey primarily uses self-enumeration through mail-out/mail-back, but both telephone and in-person followup are used for nonrespondents to the mail survey. The ACS is a nationwide survey and is intended to replace the decennial long form in future censuses. In 2001, the ACS was in start-up mode, about 107,000 households. The response rate for the ACS in 2001 was 96.7 percent.

The comparisons with ECLS-B are based on the ACS Public Use Microdata (PUMS), which include both ACS data and data from the 2001 Supplementary Survey. In order to compare data from the ECLS-B with ACS data, the latter data set was subset to households with a child aged one year or less (only single years of age are available on the public-use file). This reduced the sample size to 28,970. The PUMS database does not contain stratification and PSU variables required for variance calculations. Thus, while weighted estimates are provided for comparison, significance tests for comparing ECLS-B and the ACS/PUMS data are not given.

Table 52 compares data between the ACS and the ECLS-B on respondent's marital status, education of mother and (resident) father, number of household members, and household income. There appear to be differences with respect to marital status, mother's education, and household income. Most ACS estimates are outside the 95 percent confidence intervals for these variables, while only one is outside the confidence limits for father's education (proportion with 9^{th} to 12^{th} grade education).The respondents in the ACS were more likely to report being married and tended to report both higher mother's educational attainment and household income. The pattern of differences observed here for mother's education is similar to the differences noted between the NHES and the ECLS-B. However, since there is no indication of differences between years of education between respondents and nonrespondents, it seems unlikely that nonresponse bias is responsible for this difference (see section 5.2.2). In reporting income, the ACS estimates were smaller than those for ECLS-B for incomes below $35,000 and greater than ECLS-B for incomes above $35,000. The ACS also indicate a higher percentage of two-person households. To some degree, these differences could be due to data collection modality, since the ACS is conducted primarily as a mail survey with telephone followup, with in-person interviews as a last resort. Bushery et al. (1996) suggested that the mail-CATI survey mode may yield more accurate data collection than pure CATI, while other authors (de Leeuw 1988, Krysan et al. 1994) have found that the anonymity of mail data collection can yield less biased results than interviewer-administered modes. Thus, while there are differences between the ACS and the ECLS-B, mode effects could account for some of these differences.

Table 52. Comparison of 2001 American Community Survey (ACS) and ECLS-B family data, 9-month data collection: 2001–02

Characteristic		ACS	ECLS-B	Standard error	95% lower confidence interval	95% upper confidence interval
Respondent's marital status (percent)	Now married	74.3	66.6	0.62	65.3	67.7
	Widowed	1.4	0.4	0.07	0.3	0.5
	Divorced	5.8	3.8	0.27	3.4	4.4
	Separated	3.0	2.7	0.20	2.4	3.2
	Never married	15.6	26.5	0.54	25.3	27.5
Mother's highest education level (percent)	8th grade or below	6.0	6.0	0.24	5.6	6.6
	9th to 12th grade	13.2	21.3	0.52	20.4	22.4
	High school diploma/equivalent	24.3	21.8	0.44	20.9	22.7
	Some college/Voc/tec program	28.9	26.5	0.52	25.3	27.3
	Bachelor's degree	19.4	17.1	0.50	16.1	18.1
	Masters degree	5.9	5.6	0.29	5.0	6.2
	Doctorate or professional degree	2.2	1.7	0.23	1.2	2.2
Father's highest education level (percent)	8th grade or below	6.9	6.7	0.33	6.2	7.4
	9th to 12th grade	11.7	15.0	0.53	13.8	15.8
	High school diploma/equivalent	24.0	22.9	0.67	21.6	24.2
	Some college/Voc/tec program	26.7	26.1	0.65	24.8	27.4
	Bachelor's degree	20.2	19.4	0.60	18.2	20.6
	Masters degree	6.3	6.2	0.38	5.5	6.9
	Doctorate or professional degree	4.3	3.6	0.32	3.2	4.4

See note at end of table.

Table 52. Comparison of 2001 American Community Survey (ACS) and ECLS-B family data, 9-month data collection: 2001–02—Continued

Characteristic		ACS	ECLS-B	Standard error	95 percent lower confidence interval	95 percent upper confidence interval
Household members	2	7.5	2.7	0.20	2.5	3.3
	3	29.0	29.7	0.53	28.6	30.6
	4	31.7	31.4	0.58	30.5	32.7
	5	18.2	19.4	0.58	18.3	20.5
	6	7.2	9.2	0.37	8.3	9.7
	7	3.4	4.2	0.25	3.6	4.6
	8 or more	3.0	3.5	0.27	2.9	3.9
Household income ($)	5,000 or less	3.9	5.1	0.27	4.5	5.5
	5,001 to 10,000	4.7	5.6	0.34	4.9	6.3
	10,001 to15,000	5.4	7.6	0.35	6.9	8.3
	15,001 to 20,000	6.2	7.7	0.32	7.3	8.5
	20,001 to 25,000	6.1	9.5	0.39	8.7	10.3
	25,001 to 30,000	6.6	7.8	0.37	7.1	8.5
	30,001 to 35,000	6.3	6.4	0.30	5.7	6.9
	35,001 to 40,000	6.3	6.2	0.28	5.7	6.7
	40,001 to 50,000	10.7	9.0	0.33	8.2	9.4
	50,001 to 75,000	21.0	15.1	0.47	14.2	16.0
	75,001 to 100,000	10.3	10.1	0.38	9.4	10.8
	100,001 to 200,000	10.1	8.8	0.33	8.2	9.4
	200,001 or more	2.4	1.4	0.15	1.1	1.7

SOURCE: American Community Survey, U.S. Census Bureau; U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Nine-Month Data Collection, 2001–02.

6.7 Early Head Start Study of Fathers of Newborns

The Early Head Start (EHS) Research and Evaluation Project conducts research relating to the role fathers play in the lives of their infants and toddlers, in their families, and in the Early Head Start programs in which they participate. The Early Head Start father studies were among the first to investigate involvement of low-income fathers in children's lives, together with mother involvement, in the context of both an intervention program for infants and toddlers and a longitudinal study The Early Head Start father studies focused on biological fathers and father figures (sometimes referred to as “social fathers”). Expectant mothers enrolling in Head Start were asked to identify the biological father or the man who they expected to help raise the child. Repeated interviews were then conducted with the father thus identified when their children were 1, 3, 6, 14, and 24 months of age, even if the father ceased to be involved with the child. The sample of fathers was recruited at 17 Head Start research sites. However, due to difficulty with recruitment, additional sites were used. From published sources, recruitment appears to have been through volunteers; no response rates are reported (Vogel et al. 2003). Because the sample is based on volunteers from a nonrepresentative sample of child care centers, it is not possible to describe what population of children and fathers is represented in the EHS. Furthermore, since response rates are not reported, nothing can be said about the father participation rates.

Table 53 gives comparisons between ECLS-B and EHS estimates. In order to make the ECLS-B estimates more comparable to the EHS estimates, the ECLS-B sample was subset to households meeting the national guidelines for Head Start Eligibility. The latter were based on 14-month interviews, as reported in Vogel et al. (2003). Standard errors are not provided in the EHS report, but the sample size is reported as ranging from 55 to 108 for the items compared here. Standard errors for the EHS were approximated using simple random sampling (SRS) in order to compare the EHS estimates to ECLS-B estimates. Significance values shown in table 6-6 are based on two-sample tests, with complex survey estimates for standard errors in ECLS-B and SRS standard errors for EHS.

Table 53. Comparison of Early Head Start (EHS) Study of Fathers of Newborns and ECLS-B data, 9-month data collection: 2001–02

	EHS		ECLS-B			
	Estimate	Standard error	Estimate	Standard error	*Z*-score	*p*-value
Father's involvement in pregnancy: attended childbirth classes/Lamaze with mother (percent)	31.0	5.34	27.3	1.74	0.66	0.510
Father's involvement in pregnancy: listened to baby's heartbeat (percent)	92.0	3.13	89.3	1.17	0.81	0.419
Father's involvement in pregnancy: felt the baby move (percent)	97.0	1.97	97.3	0.69	-0.14	0.886
Father's involvement in pregnancy: discussed with partner (percent)	96.0	2.26	82.2	1.43	5.16	0.000
Father was in delivery room (percent)	86.0	4.01	89.4	1.08	-0.82	0.413
In past month, did resident father change child's diapers at least once per day? (percent answering "yes")	81.0	4.53	63.3	1.76	3.64	0.000
In past month, did resident father dress child at least once per day? (percent answering "yes")	57.0	5.72	47.4	1.91	1.59	0.111

See note at end of table.

Table 53. Comparison of Early Head Start (EHS) Study of Fathers of Newborns and ECLS-B data, 9-month data collection: 2001–02—Continued

Characteristic	EHS Estimate	EHS Standard error	ECLS-B Estimate	ECLS-B Standard error	Z-score	p-value
In past month, did resident father play peek-a-boo with child at least once per day (percent answering "yes")	46.0	5.75	64.0	2.52	-2.87	0.004
In past month, did resident father take child outside for a walk or to play in the yard, a park or a playground at least once per day? (percent answering "yes")	30.0	5.29	37.0	2.12	-1.25	0.213
In typical week, does resident father read to child every day? (percent answering "yes")	40.0	5.66	7.5	1.130	5.63	0.000
In typical week, does resident father sing songs to child every day? (percent answering "yes")	64.0	5.54	37.7	1.678	4.54	0.000
In typical week, does resident father tell stories to child every day? (percent answering "yes")	36.0	5.54	10.8	1.118	4.46	0.000
In past month, did resident father wash or bathe child at least once per day? (percent answering "yes")	36.0	5.54	31.0	1.77	0.86	0.390

SOURCE: *Understanding Fathering: The Early Head Start Study of Fathers of Newborns, Report to the Ford Foundation* (Vogel et al. 2003); U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

Despite the large standard errors for the EHS estimates, EHS and ECLS-B data differ significantly on numerous comparisons, including discussing the pregnancy, changing diapers, playing peek-a-boo, reading, singing songs, and telling stories. In all cases, behaviors tend to be higher in EHS than in the ECLS-B. However, there are two issues that make these data difficult to compare.

First, the EHS sample is not representative of the general household population. As noted earlier, the EHS sample is recruited from Head Start research sites and, as a result, there are some systematic differences between the EHS and ECLS-B samples. Restricting the ECLS-B sample to low income households makes the two datasets more comparable. However, there is no way of measuring what other differences exist.

A second difference is in questionnaire design, particularly for the "helping" behaviors, such as bathing, dressing, etc. In EHS, the father was asked directly if he performed the behavior at least once per day. In ECLS-B, the father was asked how many times he performed the behavior in a typical week (not at all, once or twice, 3 to 6 times, or every day). To facilitate the comparison in table 53, ECLS-B data have been collapsed to indicate whether the father indicated once per day or not. While it may appear that the data are comparable, such differences in questionnaire approach and wording can affect responses.[5]

Clearly, there are differences in survey estimates between the EHS fathers of newborns study and the ECLS-B. It is likely that they are due to differences in the sample composition and questionnaire wording.

[5] For more information and examples about differences caused by questionnaire wording and approach, see Kalton and Schuman 1982 and Siegel et al. 2001.

6.8 The Fragile Families Study

The Fragile Families and Child Wellbeing Study is an ongoing study that is following a birth cohort of primarily unwed parents and their children over a 5-year period. The study was designed to provide information on the capabilities and relationships of unwed parents, as well as the effects of policies on family formation and child wellbeing.

The data are intended to be representative of nonmarital births in U.S. cities with populations over 200,000. The sampling occurred in three stages: The first stage consisted of sampling 20 cities; then hospitals within cities, and finally, births to unwed mothers within hospitals. From published sources, it appears that mothers were approached sequentially until a target sample size had been attained (Vu 2003). Mothers were approached within 48 hours of birth for study participation. Fathers were interviewed as soon as possible after the mother's enrollment. Approximately 85 percent of mothers who were approached agreed to participate; 76 percent of fathers were interviewed for the study. Followup interviews with both parents will take place (or took place) when the child is 1, 3, and 5 years old (McLanahan et al. 2003); baseline data (at 1 year) are used in this analysis. The baseline data presented here were collected from 2,659 unwed couples between April 1998 and August 2000. (The "couples" in the Fragile Families Study consisted of a birth mother and the biological father. However, the couples did not need not to be cohabiting or even have social contact.) The response rate for the baseline data is not given in the published report.

Table 54 presents data that are common to both ECLS-B and the Fragile Families study, as presented in the Fragile Families Baseline National Report (McLanahan et al. 2003). Since the report does not include standard errors, table 55 provides confidence intervals on the ECLS-B estimates that can be used to compare with Fragile Families estimates. In order to be more comparable to the Fragile Families cohort, the ECLS-B data have been subset to unmarried mothers and to respondents in metropolitan areas with 250,000 or greater population.

Reviewing table 54, there are a number of differences (specifically, alcohol use during pregnancy,[6] household income, race/ethnicity, mother's education, and mother's age) between the ECLS-B sample and the Fragile Families sample. Many of these differences probably result from the manner in which the latter sample was selected. More mothers in Fragile Families used alcohol than in the ECLS-B (10 percent versus 2.8 percent of unmarried mothers in the ECLS-B). However, as shown in section 5-2

[6] In the ECLS-B, the data on alcohol use for this comparison were taken from the survey data, not the birth certificate.

of this report, the differences between respondents and nonrespondents in the ECLS-B were negligible with respect to alcohol use as reported on the birth certificate. More mothers in Fragile Families were Black or Hispanic (79 percent in Fragile Families versus about 61 percent of unmarried mothers in the ECLS-B). Household income was somewhat higher among mothers in the Fragile Families study than among unmarried mothers in ECLS-B. More mothers in Fragile Families had only a high school education (36 percent versus 26 percent of unmarried mothers in the ECLS-B). Finally, mothers in Fragile Families were younger (27 percent aged 15 to 19 versus 16 percent of unmarried mothers in the ECLS-B).

The Fragile Families study claims to be "representative of all non-marital births in the U.S. to parents residing in cities with population over 200,000" (McLanahan et al. 2003). However, there are substantial differences in the demographic makeup of the sample that go far beyond the minor departures seen in comparing the ECLS-B sample to the Natality Detail file. Given the lack of clear documentation regarding sampling methods for the Fragile Families study, it appears likely that the differences between these studies are due to sample selection.

Table 54. Comparison of the Fragile Families Study and ECLS-B data on unmarried couples, 9-month data collection: 2001–02

Characteristic	Fragile Families	ECLS-B: unmarried mothers			
		Estimate	Standard error	Confidence interval Lower	Confidence interval Upper
Child covered by any health insurance? (percent)					
Yes	94	94	0.67	92.1	94.7
No	6	7	0.67	5.3	7.9
Does child have private health insurance? (percent)					
Yes	23	29	1.80	25.9	33.0
No	77	71	1.80	67.0	74.1
Used alcohol during last 3 months of pregnancy? (percent)					
Yes	10	3	0.59	1.7	3.9
No	90	97	0.59	95.8	98.2
Household income ($)					
5,000 or less	6	12	0.85	10.1	13.5
5,001 to 20,000	33	35	1.51	32.3	38.2
20,001 to 50,000	42	41	1.46	37.8	43.6
50,001 or more	19	13	1.05	10.5	14.7

See notes at end of table.

Table 54. Comparison of the Fragile Families Study and ECLS-B data on unmarried couples, 9-month data collection: 2001–02—Continued

Characteristic	Fragile Families	ECLS-B: unmarried mothers			
		Estimate	Standard error	Confidence interval Lower	Confidence interval Upper
Race/ethnicity of mother/female guardian (percent)					
White, non-Hispanic	17	31	1.26	28.2	33.2
Black or African American, non-Hispanic	44	30	1.31	27.8	33.0
Hispanic	35	35	1.26	32.8	37.8
Other	4	4	0.33	3.1	4.4
Resident mother's highest education level (percent)					
Less than high school	43	47	1.47	44.3	50.1
High school diploma /equiv.	36	29	1.36	25.8	31.1
Some college	18	19	1.05	16.9	21.1
Bachelor's degree or higher	2	6	0.68	4.4	6.8
Child birth weight status (percent)					
Normal birth weight	90	90	0.38	89.5	91.0
Low birth weight	10	10	0.38	9.0	10.5
Age of resident mother					
15 to 19	27	16	0.83	14.9	18.1
20 to 24	39	42	1.24	39.9	44.8
25 to 29	16	19	1.12	17.0	21.5
30 or more	18	22	1.07	20.0	24.3

NOTE: Numbers may not sum to 100 due to rounding. Numbers are reported in whole percents, as originally reported in the Fragile Families report.
SOURCE: *The Fragile Families and Child Wellbeing Study Baseline National Report.* (McLanahan et al. 2003); U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Data Collection, 2001–02.

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APPENDIX A

Standard errors and design effects for the full sample, 9-month data collection: 2001–02

Weight	Survey item	Variable name	Number of cases	Estimate	Design SE	SRS SE	DEFF	DEFT
P	P1 CD120C DEMANDS ATTENTION AND COMPANY	P1ATTN	2,074	18.99	0.550	0.380	2.100	1.449
P	P1 CH005 STATUS OF CHILD HEALTH	P1CHEALT	6,251	61.70	0.661	0.471	1.973	1.405
P	P1 HE102D HOW OFTN TAKE CHILD ON ERRANDS	P1ERRAND	437	1.91	0.174	0.132	1.738	1.318
P	P1 CD120A IS FUSSY OR IRRITABLE	P1FUSSY	3,729	36.90	0.628	0.467	1.808	1.345
P	P1 CD120E NEEDS HELP TO FALL ASLEEP	P1HLPSLP	5,932	56.17	0.786	0.480	2.680	1.637
P	P1 CD120G CRIES FOR FOOD OR TOYS	P1NOWAIT	2,980	27.86	0.624	0.434	2.070	1.439
P	P1 HE102A HOW OFTEN YOU READ TO CHILD	P1READBO	1,383	12.12	0.479	0.316	2.296	1.515
P	P1 HE102C HOW OFTEN YOU ALL SING SONGS	P1SINGSO	237	2.07	0.197	0.138	2.040	1.428
P	P1 CD120F STARTLED BY LOUD SOUNDS	P1STRTL	6,027	58.46	0.742	0.477	2.421	1.556
P	P1 HE102B HOW OFTN YOU TELL CDH STORIES	P1TELLST	2,480	22.29	0.642	0.402	2.545	1.595
P	P1 CD120D WAKES UP 3 OR MORE TIMES	P1WAKES	7,293	70.12	0.816	0.443	3.391	1.841
P	P1 CD120B GOES FROM WHIMPER TO CRYING	P1WHMPR	4,629	45.95	0.714	0.482	2.190	1.480
P	X1 HSHLD FOOD SECURITY - STATUS CTGRY	X1FSSTAT	9,331	87.73	0.554	0.317	3.046	1.745
P	X1 TYPE RES FATHER-BIRTH/ADOPT/STEP/FOST	X1FTHTYP	8,304	78.73	0.483	0.396	1.488	1.220
P	X1 TYPE OF FAMILY	X1HFAMIL	5,558	49.65	0.538	0.484	1.237	1.112
P	X1 CH PARENTS WHO RESIDE IN HOUSEHOLD	X1HPARNT	8,282	78.55	0.482	0.397	1.471	1.213
P	X1 HH FATHER/MALE GUARD-WRK STAT W/IMP	X1IFTHLB	7,916	94.59	0.332	0.246	1.819	1.349
P	X1 HH MOTHER/FEMALE GUARD-WRK STAT W/IMP	X1IMOMLB	6,221	60.28	0.934	0.475	3.865	1.966
P	X1 POVERTY INDICATOR	X1POVRTY	2,603	22.87	0.600	0.406	2.179	1.476
P	X1 PRIM CARE ARRNGMNT WHERE MOST HRS/WK	X1PRIMNW	5,352	49.95	0.794	0.484	2.695	1.642
P	X1 QUINTILE INDICATOR FOR SOCIOECON SCAL	X1SESQ5	2,110	20.05	0.455	0.387	1.379	1.174
P	P1 CD090 AGE WHEN STARTED CRAWLING(MTHS)	P1AGCRWL	9,056	7.17	0.024	0.016	2.360	1.536
P	P1 CD080 AGE SITTING WITHOUT SPPRT(MTHS)	P1AGSIT	10,268	6.08	0.019	0.013	2.042	1.429
P	P1 CD100 AGE PULLED SELF TO STAND(MTHS)	P1AGSTND	8,842	7.99	0.025	0.015	2.733	1.653
P	P1 CD110 AGE WALKING WITH HELP(MONTHS)	P1AGWALK	7,863	8.61	0.029	0.016	3.364	1.834
P	X1 HSHLD FOOD SECURITY-SCALE SCR (RASCH)	X1FSSCAL	2,485	3.66	0.061	0.042	2.135	1.461
P	X1 TOTAL NUMBER OF HOUSEHOLD MEMBERS	X1HTOTAL	10,688	4.31	0.017	0.014	1.453	1.205
P	X1 NUMBER OF HH MEMBERS LESS THAN 18	X1LESS18	10,688	2.13	0.013	0.012	1.238	1.113
P	X1 FAMILY SOCIOECONOMIC SCALE	X1SESL	10,688	-0.08	0.008	0.008	1.041	1.020

See note at end of table.

Standard errors and design effects for the full sample, 9-month data collection: 2001–02—Continued

Weight	Survey item	Variable name	Number of cases	Estimate	Design SE	SRS SE	DEFF	DEFT
PC	X1 CHILD BIRTH WEIGHT STATUS	X1BTHWGT	7,501	92.51	0.002	0.000	0.000	0.000
PC	X1 CHILD SEX	X1CHSEX	5,221	51.06	0.087	0.494	0.031	0.176
PC	X1 RACE/ETHNICITY - CHILD	X1CHRACE	4,262	53.38	0.541	0.494	1.197	1.094
PC	X1 MULTIPLE BIRTH STATUS INDICATOR	X1MBRTST	8,486	96.82	0.002	0.000	0.000	0.000
PC	X1 CHILD SAMPLED AS TWIN	X1TWSAMP	1,572	2.94	0.029	0.167	0.030	0.173
PC	X1 CHILDS ASSESSMENT AGE IN MONTHS	X1ASAGE	10,221	10.48	0.048	0.019	6.104	2.471
PC	X1 PM - CHILD'S LENGTH (CM)	X1CHLENG	10,156	73.10	0.090	0.040	5.128	2.265
PC	X1 PM - CHILD'S WEIGHT (KG)	X1CHWGHT	9,993	9.57	0.044	0.017	7.039	2.653
PC	X1 MENTAL PROB1: EXPLORES OBJECTS	X1MTL1	10,195	0.99	0.000	0.000	3.708	1.926
PC	X1 MENTAL PROB2: EXPLORES PURPOSEFULLY	X1MTL2	10,195	0.91	0.003	0.001	7.287	2.699
PC	X1 MENTAL PROB3: BABBLES	X1MTL3	10,195	0.55	0.005	0.002	7.892	2.809
PC	X1 MENTAL PROB4: EARLY PROBLEM SOLVING	X1MTL4	10,195	0.09	0.004	0.002	6.198	2.490
PC	X1 MENTAL PROB5: USES WORDS	X1MTL5	10,195	0.03	0.002	0.001	5.106	2.260
PC	X1 MENTAL T-SCORE	X1MTLTSC	10,195	50.00	0.216	0.099	4.747	2.179
PC	X1 MOTOR PROB1: EYE-HAND COORDINATION	X1MTR1	10,166	0.92	0.001	0.001	3.601	1.898
PC	X1 MOTOR PROB2: SITTING	X1MTR2	10,166	0.95	0.001	0.001	3.096	1.760
PC	X1 MOTOR PROB3: PRE-WALKING	X1MTR3	10,166	0.79	0.004	0.002	4.117	2.029
PC	X1 MOTOR PROB4: INDEPENDENT WALKING	X1MTR4	10,166	0.31	0.007	0.003	5.576	2.361
PC	X1 MOTOR PROB5: BALANCE	X1MTR5	10,166	0.06	0.003	0.001	5.645	2.376
PC	X1 MOTOR T-SCORE	X1MTRTSC	10,166	50.00	0.176	0.099	3.160	1.778
PC	X1 NCATS - TOTAL CHILD SCORE	X1NCATTC	8,606	15.50	0.048	0.029	2.724	1.650
PC	X1 NCATS - TOTAL PARENT SCORE	X1NCATTP	8,608	34.68	0.082	0.049	2.851	1.688
PC	X1 NCATS - TOTAL SCORE	X1NCATTS	8,608	50.18	0.102	0.062	2.698	1.643
PF	F1 Q3A CHANGE CHILDS DIAPER	F1CGDIAP	3,244	48.77	0.849	0.637	1.778	1.333
PF	F1 Q4D STAY HOME W/ILL CHILD	F1STYHM	783	11.71	0.651	0.411	2.506	1.583
PF	F1 Q4C TAKE CHILD TO DOCTOR	F1DCTR	1,333	18.62	0.598	0.497	1.446	1.202
PF	F1 Q2D HOW OFTN TAKE CHILD ON ERRANDS	F1ERRAND	732	9.81	0.474	0.379	1.564	1.251
PF	F1 Q3C FEED/GIVE CHILD BOTTLE	F1FEEDBT	3,133	45.96	0.892	0.637	1.961	1.400

See note at end of table.

Standard errors and design effects for the full sample, 9-month data collection: 2001–02—Continued

Weight	Survey item	Variable name	Number of cases	Estimate	Design SE	SRS SE	DEFF	DEFT
PF	F1 Q4A WAKE W/CHILD AT NIGHT	F1GETUP	892	14.06	0.777	0.443	3.074	1.753
PF	F1 Q3D PLAY PEEKABOO W/CHILD	F1PEEKC	2,210	34.68	0.798	0.609	1.718	1.311
PF	F1 Q3B PREPARE MEALS/BOTTLES	F1PREPFD	3,018	45.31	0.836	0.635	1.731	1.316
PF	F1 Q2A HOW OFTEN YOU READ TO CHILD	F1READBO	1,774	27.88	0.775	0.572	1.833	1.354
PF	F1 Q2C HOW OFTEN YOU ALL SING SONGS	F1SINGSO	771	11.30	0.514	0.406	1.605	1.267
PF	F1 Q4B SOOTHE UPSET CHILD	F1SOOTHE	1,194	17.91	0.727	0.491	2.195	1.482
PF	F1 Q2B HOW OFTN YOU TELL CH STORIES	F1TELLST	1,874	29.24	0.722	0.584	1.528	1.236
PF	N1 Q12 HOW YOU FEEL ABOUT BEING A FATHER	N1FTHSLF	11	3.08	1.207	0.666	3.284	1.812
PF	N1 Q9 FATHER WANTED CH WHEN BEC PRGNT	N1FWTBBY	363	54.32	2.797	1.936	2.088	1.445
PF	N1 Q13 HOW IS RELATIONSHIP W/CHILD'S MOM	N1RELM	549	79.18	2.326	1.567	2.203	1.484
PF	N1 Q3 HOW OFTEN SPENT 1+ HOURS W/CHILD	N1SPHR1	15	2.42	0.864	0.626	1.906	1.381
PF	N1 Q6 HOW OFTEN TALK WITH CHILD'S MOTHER	N1TALKM	540	79.77	2.162	1.557	1.929	1.389
PF	X1 RES FATHER HIGHEST EDUCATION LEVEL	X1FTHED	277	6.74	0.447	0.316	2.002	1.415
PF	X1 TYPE RES FATHER-BIRTH/ADOPT/STEP/FOST	X1FTHTYP	6,218	86.15	0.481	0.413	1.355	1.164
PF	X1 HH FATHER/MALE GUARD-WORK STATUS	X1HFEMP	5,177	85.60	0.623	0.450	1.914	1.383
PF	X1 NON-RES FATHER HIGHEST EDUCATIONLEVEL	X1NRFED	17	3.06	0.748	0.646	1.340	1.158
PF	X1 NON-RES FATHER WORK STATUS	X1NRFEMP	362	60.88	2.529	1.956	1.671	1.293
PF	N1 Q2 SEEN CHILD IN LAST 3 MONTHS	N1SEE3MO	576	50.80	1.766	1.393	1.607	1.268
PF	X1 HH FATHER-OCC GSS PRESTIGE SCORE	X1FTHSCR	5,674	42.85	0.180	0.135	1.776	1.333
PCF	F1 Q3A CHANGE CHILDS DIAPER	F1CGDIAP	3,173	48.83	0.857	0.644	1.769	1.330
PCF	F1 Q4D STAY HOME W/ILL CHILD	F1STYHM	766	11.78	0.661	0.418	2.504	1.582
PCF	F1 Q4C TAKE CHILD TO DOCTOR	F1DCTR	1,304	18.75	0.596	0.504	1.397	1.182
PCF	F1 Q2D HOW OFTN TAKE CHILD ON ERRANDS	F1ERRAND	706	9.60	0.514	0.379	1.835	1.355
PCF	F1 Q3C FEED/GIVE CHILD BOTTLE	F1FEEDBT	3,067	46.07	0.899	0.645	1.943	1.394
PCF	F1 Q4A WAKE W/CHILD AT NIGHT	F1GETUP	868	13.98	0.778	0.447	3.028	1.740
PCF	F1 Q3D PLAY PEEKABOO W/CHILD	F1PEEKC	2,164	35.05	0.822	0.618	1.771	1.331
PCF	F1 Q3B PREPARE MEALS/BOTTLES	F1PREPFD	2,953	45.45	0.858	0.643	1.781	1.335
PCF	F1 Q2A HOW OFTEN YOU READ TO CHILD	F1READBO	1,741	28.03	0.794	0.580	1.871	1.368
PCF	F1 Q2C HOW OFTEN YOU ALL SING SONGS	F1SINGSO	746	11.29	0.540	0.411	1.723	1.313

See note at end of table.

Standard errors and design effects for the full sample, 9-month data collection: 2001–02—Continued

Weight	Survey item	Variable name	Number of cases	Estimate	Design SE	SRS SE	DEFF	DEFT
PCF	F1 Q4B SOOTHE UPSET CHILD	F1SOOTHE	1,163	17.98	0.749	0.497	2.274	1.508
PCF	F1 Q2B HOW OFTN YOU TELL CH STORIES	F1TELLST	1,827	29.38	0.724	0.592	1.497	1.224
PCF	N1 Q12 HOW YOU FEEL ABOUT BEING A FATHER	N1FTHSLF	11	3.18	1.239	0.688	3.246	1.802
PCF	N1 Q9 FATHER WANTED CH WHEN BEC PRGNT	N1FWTBBY	352	54.49	2.635	1.966	1.797	1.341
PCF	N1 Q13 HOW IS RELATIONSHIP W/CHILD'S MOM	N1RELM	533	79.24	2.453	1.591	2.377	1.542
PCF	N1 Q3 HOW OFTEN SPENT 1+ HOURS W/CHILD	N1SPHR1	15	2.47	0.891	0.643	1.920	1.386
PCF	N1 Q6 HOW OFTEN TALK WITH CHILD'S MOTHER	N1TALKM	521	79.08	2.254	1.601	1.983	1.408
PCF	X1 RES FATHER HIGHEST EDUCATION LEVEL	X1FTHED	269	6.75	0.454	0.320	2.009	1.417
PCF	X1 TYPE RES FATHER-BIRTH/ADOPT/STEP/FOST	X1FTHTYP	6,067	86.14	0.472	0.418	1.274	1.129
PCF	X1 HH FATHER/MALE GUARD-WORK STATUS	X1HFEMP	5,059	85.54	0.621	0.456	1.853	1.361
PCF	X1 NON-RES FATHER HIGHEST EDUCATIONLEVEL	X1NRFED	17	3.16	0.781	0.667	1.369	1.170
PCF	X1 NON-RES FATHER WORK STATUS	X1NRFEMP	352	60.96	2.575	1.987	1.680	1.296
PCF	N1 Q2 SEEN CHILD IN LAST 3 MONTHS	N1SEE3MO	558	50.61	1.680	1.419	1.402	1.184
PCF	X1 HH FATHER-OCC GSS PRESTIGE SCORE	X1FTHSCR	5,538	42.87	0.178	0.137	1.694	1.302

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Nine-Month Data Collection, 2001–02.