An Evaluation of Bias in the 2007 National Household Education Surveys Program

Results from a Special Data Collection Effort

NCES 2009–029
U.S. DEPARTMENT OF EDUCATION

ies NATIONAL CENTER FOR EDUCATION STATISTICS
Institute of Education Sciences

An Evaluation of Bias in the 2007 National Household Education Surveys Program

Results from a Special Data Collection Effort

MARCH 2009

Wendy Van de Kerckhove
Jill M. Montaquila
Priscilla R. Carver
J. Michael Brick
Westat

Chris Chapman
Project Officer
National Center for Education Statistics

NCES 2009–029
U.S. DEPARTMENT OF EDUCATION

NHES
National Household
Education Surveys Program

ies NATIONAL CENTER FOR EDUCATION STATISTICS
Institute of Education Sciences

U.S. Department of Education
Arne Duncan
Secretary

Institute of Education Sciences
Sue Betka
Acting Director

National Center for Education Statistics
Stuart Kerachsky
Acting Commissioner

The National Center for Education Statistics (NCES) is the primary federal entity for collecting, analyzing, and reporting data related to education in the United States and other nations. It fulfills a congressional mandate to collect, collate, analyze, and report full and complete statistics on the condition of education in the United States; conduct and publish reports and specialized analyses of the meaning and significance of such statistics; assist state and local education agencies in improving their statistical systems; and review and report on education activities in foreign countries.

NCES activities are designed to address high-priority education data needs; provide consistent, reliable, complete, and accurate indicators of education status and trends; and report timely, useful, and high-quality data to the U.S. Department of Education, the Congress, the states, other education policymakers, practitioners, data users, and the general public. Unless specifically noted, all information contained herein is in the public domain.

We strive to make our products available in a variety of formats and in language that is appropriate to a variety of audiences. You, as our customer, are the best judge of our success in communicating information effectively. If you have any comments or suggestions about this or any other NCES product or report, we would like to hear from you. Please direct your comments to

National Center for Education Statistics
Institute of Education Sciences
U.S. Department of Education
1990 K Street NW
Washington, DC 20006-5651

March 2009

The NCES World Wide Web Home Page address is http://nces.ed.gov.
The NCES World Wide Web Electronic Catalog is http://nces.ed.gov/pubsearch.

Suggested Citation
Van de Kerckhove, W., Montaquila, J.M., Carver, P. R., and Brick, J.M. (2008). *An Evaluation of Bias in the 2007 National Households Education Surveys Program: Results From a Special Data Collection Effort* (NCES 2009–029). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

For ordering information on this report, write to
U.S. Department of Education
ED Pubs
P.O. Box 1398
Jessup, MD 20794-1398

or call toll free 1-877-4ED-Pubs or order online at http://www.edpubs.org.

Content Contact
Christopher Chapman
(202) 502-7414
Chris.Chapman@ed.gov

CONTENTS

List of Tables

List of Tables

List of Appendix Tables

List of Figures

List of Exhibits

This page is intentionally blank.

EXECUTIVE SUMMARY

The theory of sampling that is the basis for the majority of surveys conducted for the federal government assumes that accurate responses are obtained for all the sampled units and that the sample covers the target population. Surveys have always had some level of nonresponse, thus violating this assumption. To the extent that those who respond to surveys and those who do not are different in important ways, there is a potential for biases in estimates from survey data. As survey response rates decline, understanding the relationship between response rates and nonresponse bias has become even more important. Additionally, telephone survey methodologists are concerned with differences in telephone noncoverage rates, especially differential rates among population subgroups, such as those defined by region, age, race/ethnicity, and household composition, because they too can introduce bias in the estimates. The study described in this report was designed to examine bias in estimates from the 2007 National Household Education Surveys Program (NHES:2007) due to nonresponse from both refusals and noncontact cases, as well as bias due to noncoverage of households that only had cell phones and households without any telephones.

NHES is a random digit dialing (RDD) survey program developed by the National Center for Education Statistics (NCES) in the Institute of Education Sciences, U.S. Department of Education. It is designed to collect information on important educational issues through telephone surveys of households in the United States. NHES has enabled NCES to gather data on a wide range of issues that cannot be measured in traditional institution-based data collections, such as early childhood care and education, children's readiness for school, parent perceptions of school safety and discipline, before- and after-school activities of school-age children, participation in adult and continuing education, parent involvement in education, school choice, homeschooling, and civic involvement.

The sample drawn for this study to assess bias, hereinafter referred to as the Bias Study, was an area sample, selected independently of the NHES:2007 RDD sample. The sampled addresses for the Bias Study were matched to telephone numbers, and an attempt was made to gain cooperation by telephone when a telephone number was available. These cases followed the same telephone interviewing protocol as NHES:2007 RDD cases. All nonhostile[1] nonresponse cases and cases that were found to be incorrectly matched to a telephone number or potentially incorrectly matched to a telephone number were sent for in-person follow-up. The field interviewer's job was to verify that the address was a dwelling unit, verify the address (and confirm the telephone number if there was one) with a resident of the household, and attempt to gain cooperation, (i.e., complete the Screener interview). Upon gaining

[1] Nonhostile cases are those that were not deemed abusive or profane.

cooperation, field interviewers would connect the respondent with the Telephone Research Center (TRC) on either a cellular telephone carried by the interviewer or a household telephone via a toll-free number. The household respondent would then complete the Screener with the TRC interviewer. The Bias Study data collection process for the household Screener is summarized in exhibit ES-1. Demographic information collected in the Screener about household members was used to determine whether anyone was eligible for any of the three extended interviews: the School Readiness (SR) survey of school-aged children, the Parent and Family Involvement in Education (PFI) survey of school-aged children, and the Adult Education for Work-Related reasons (AEWR) survey. The extended interviews were also conducted with the TRC interviewer.

In addition to the survey data, two special data collection instruments—an Interviewer Observation Form (IOF) and a maximum call postcard—were designed and used for the Bias Study. Before approaching a sampled residence, field interviewer's first task was to note observations about the neighborhood and the sampled address using the IOF. The IOF was intended to capture observations on a number of factors including urbanicity, neighboring area land use (e.g., residential, commercial, or industrial), neighborhood and household affluence, indicators of neighborhood safety or household security, indicators of children in the area, and language diversity. Following the field effort, when a case was classified as a final maximum call case, with a supervisor's approval, field interviewers left a postcard that contained four questions about the household. Both the IOF and the maximum call postcard provided additional information about field nonrespondents that was used in the analysis.

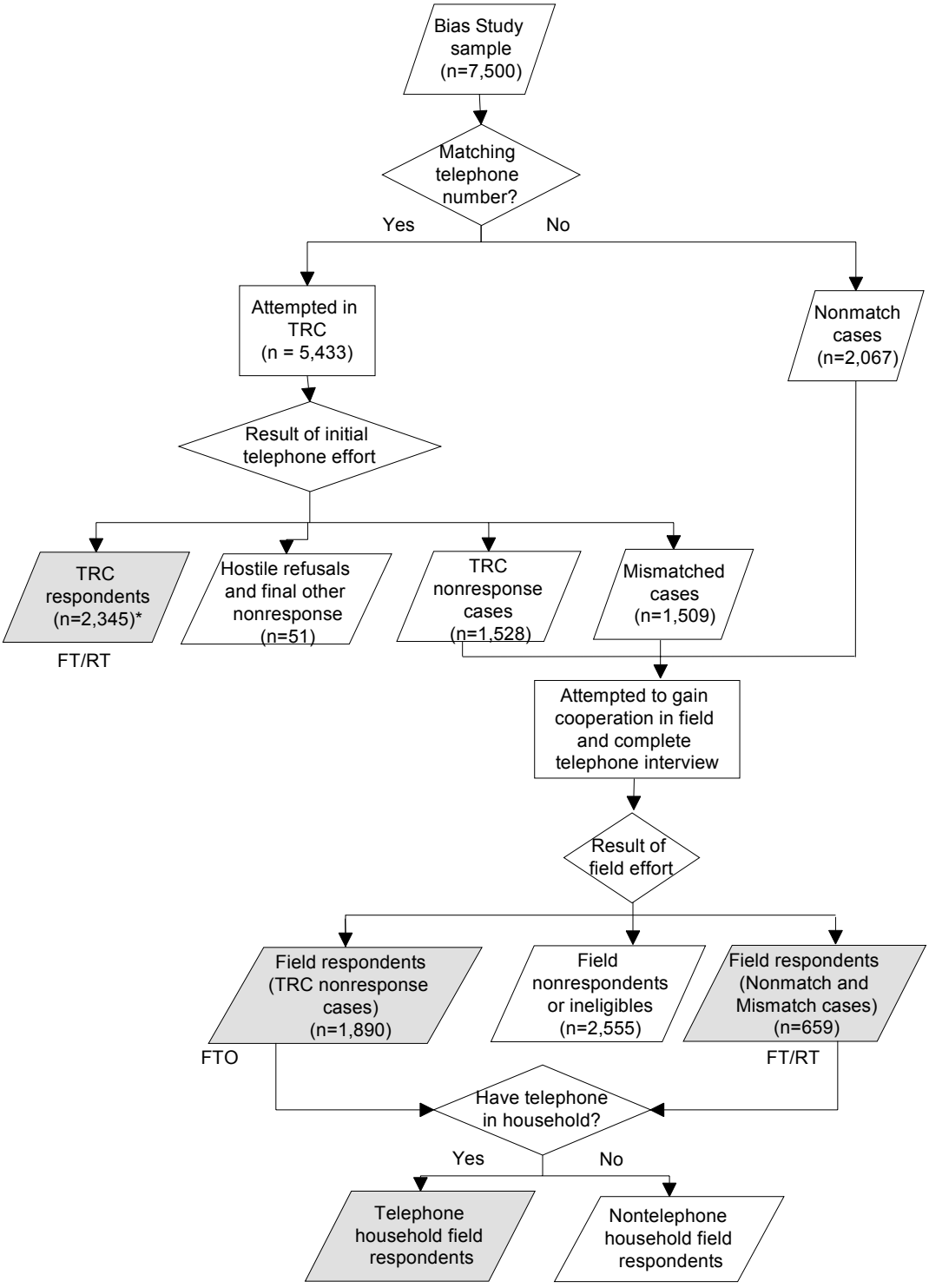
Among the 7,500 cases sampled for the Bias Study, a total of 5,104 were sent to the field for in-person attempts. Overall, 50 percent of the Screener cases finalized in the field were finalized as completed Screeners. Among cases with no matching telephone number and those with a mismatched telephone number, the percentages finalized in the field as completed Screeners were 52 percent and 54 percent, respectively. Among the telephone maximum call, noncontact, refusal, and language problem cases, the percentages finalized in the field as completed Screeners were 46 percent, 45 percent, 42 percent, and 23 percent, respectively. The final number of completed Screeners and extended interviews for the RDD sample and Bias Study sample are provided in table ES-1.

Table ES-1. Number of completed cases by data collection stage: NHES:2007 RDD sample; NHES:2007 Bias Study sample

Data collection stage	RDD sample	Bias Study sample
Screener	54,034	4,894
Extended interview		
School Readiness (SR)	2,633	292
Parent and Family Involvement in Education (PFI)	10,681	1,123
Adult Education for Work-Related Reasons (AEWR)	7,710	1,065

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Exhibit ES-1. Data collection process for household Screeners: NHES:2007 Bias Study sample



* Includes 109 potential mismatches and 1 RDD duplicate that were not sent to the field.
TRC: Telephone research center; FT/RT: Full treatment and reduced treatment; FTO: Full treatment only;
n: Number of households

The goal of the research is to investigate bias in the estimates due to unit nonresponse and noncoverage, through the use of field follow-up of cases for which an interview could not be completed by telephone. The analysis involved two main steps. First, overall bias was evaluated by comparing final, adjusted estimates from the RDD sample to those from the Bias Study sample (completed extended interviews from FT/RT and FTO cells of figure ES-1). Since the Bias Study sample has a higher response rate and coverage of nontelephone households, differences between the two estimates are believed to be an indication of nonresponse and/or noncoverage bias in the RDD estimates. Prior to this analysis, Bias Study estimates were compared to external estimates from the Current Population Estimate as a check of their reasonableness. In addition, RDD estimates were compared before and after the weighting adjustments to evaluate the effect of the weighting.

The second main step of the analysis was to evaluate the nonresponse and noncoverage bias components separately. Following up with nonrespondents from the telephone effort allows an investigation of nonresponse bias, and following up with households with no landline telephone allows an investigation of noncoverage bias. Specifically, nonresponse bias was evaluated by comparing estimates from the reduced treatment Bias Study sample (completed extended interviews from FT/RT cells of figure ES-1) to the full treatment Bias Study sample (completed extended interviews from FT/RT and FTO cells of figure ES-1). In the reduced treatment, the TRC status is treated as the final household status for Bias Study cases attempted in the TRC. In the full treatment, the final household status is based on efforts in both the TRC and in the field. This nonresponse study is limited because data on the households that did not respond to the Bias Study are not available. Thus, statements about the likely bias associated with the nonresponse of these households cannot be evaluated directly, and inferences about this bias are based on model assumptions. General characteristics of the field nonrespondents were described using the IOF and maximum postcard data.

The other component of interest, noncoverage bias, was evaluated by comparing fully weighted estimates from the full Bias Study sample (completed extended interviews from FT/RT and FTO cells of figure ES-1) to estimates from the Bias Study sample restricted to telephone households (telephone household field respondents cell of figure ES-1). For this section, nontelephone households are defined as those without a landline so that the noncoverage bias associated with standard RDD surveys that do not include cell phones can be estimated. The NHES:2007 Bias Study survey instruments included a series of questions to capture the presence and number of telephone numbers in the household, so nontelephone households could be identified through the responses to these questions.

This analysis extends beyond the most common approach to bias analyses suggested in Seastrom (2002) in that it includes a full-scale data collection effort directed entirely at estimating bias. The most common methods use existing data to evaluate bias. The more typical nonresponse and noncoverage bias approaches have been used in the evaluation of bias in earlier NHES surveys. As a result, the current analysis complements and includes methods used in earlier investigations, such as comparisons to estimates from other surveys with higher responses. Those studies found little evidence of nonresponse or noncoverage bias in estimates from previous NHES surveys.

Results from this study suggest that there is no systematic pattern of bias in key statistics from the NHES:2007. The comparison of the fully weighted RDD estimates to Bias Study estimates indicated the RDD survey underestimated the percentages of preschoolers:

- Who count to 20 or higher;
- Whose speech is often understandable to a stranger; and
- Who watch 2 or more hours of TV in a typical weekday;

and overestimated:

- The percentage of preschoolers whose mother is not in the labor force; and
- The percentage of adults who are currently married.

However, the majority of estimates evaluated showed no evidence of bias of substantive importance.[2]

In addition to the evaluation of overall bias in the NHES:2007 estimates, the Bias Study also allowed for the estimation of the nonresponse and noncoverage bias components. The NHES:2007 estimates were produced using weights that were adjusted for nonresponse and calibrated to population totals—adjustments that are expected to reduce nonresponse and noncoverage bias. The results from the NHES:2007 Bias Study, in concert with the previous bias analyses, suggest that:

- Despite the falling response rates, there is no bias of substantive importance in the NHES:2007 estimates due to nonresponse.

[2] Bias of substantive importance is defined as a statistically significant difference of 5 percentage points or more or relative differences of 3 or more (i.e., when one estimate is 3 or more times larger than the other). The Bias Study was designed to allow detection of a 5 percentage point difference in key statistics. For NHES, this is considered a meaningful threshold to use to identify which statistically significant differences are of substantive importance.

- A comparison of estimates before and after the raking adjustments indicated potential noncoverage biases in some unadjusted SR survey outcome estimates, as well as in some demographic estimates, that were reduced through the weighting process (see section 7.3 for a complete list).

- While the weighting adjustments appear to have reduced noncoverage bias, the Bias Study analysis did provide evidence of the potential for noncoverage in the RDD survey to result in an overestimate of the percentage of preschoolers whose parents' highest educational attainment is beyond a high school diploma.

Although estimates of noncoverage bias in other final estimates examined in this study are not of substantive importance as defined for this report, noncoverage bias may become more of an issue in the future as more households drop their landline telephone service.

1. INTRODUCTION

The theory of sampling that is the basis for the majority of surveys conducted for the federal government assumes that accurate responses are obtained for all the sampled units and that the sample covers the target population. The study described in this report was designed to examine bias in the 2007 surveys of the National Household Education Surveys Program (NHES), a random digit dial (RDD) telephone survey sponsored by the National Center for Education Statistics (NCES). Specifically, the types of bias examined are bias due to nonresponse from both refusals and noncontact cases as well as noncoverage bias due to the exclusion of households that only had cell phones and households without telephones. Surveys have always had some level of nonresponse, thus violating the assumption that responses are obtained for all sampled units, and the level of nonresponse has been increasing over time. For example, Atrostic et al. (2001) report that the rates of nonresponse were increasing for in-person household surveys conducted by the U.S. Census Bureau at the end of the 20th century. The response rates for the Survey of Consumer Attitudes, an RDD survey like the NHES, declined by an annual rate of three-quarters of a percentage point from 1979 to 1996, and by 1.5 percentage points per year on average from 1996 to 2003 (Curtin, Presser, and Singer 2005).

To the extent that those who respond to surveys and those who do not are different in important ways, there is a potential for biases in estimates from survey data. As survey response rates decline, understanding the relationship between response rates and nonresponse bias has become increasingly important. One approach to understanding the relationship is to conduct nonresponse bias studies. The literature is replete with examples of such studies (see, for example, Boyle et al. (2002), Cohen and Duffy (2002), Garretsen et al. (2002), and Keeter et al. (2000)). Several years ago, NCES introduced a formal requirement to conduct nonresponse bias studies for its surveys when response rates fall below established levels for different types of data collections (Seastrom 2002), and the Office of Management and Budget has more recently issued guidelines that have similar requirements for all federal government surveys (Office of Management and Budget 2006). Although there is the potential for nonresponse bias in survey estimates, statistical adjustments that account for differences in response propensities can reduce nonresponse bias.

Differences in telephone noncoverage rates, especially differential rates among population subgroups, such as those defined by region, age, race/ethnicity, and household composition, are of concern to telephone survey methodologists because they too can introduce bias in the estimates. The list-assisted RDD method used to sample telephone numbers in the NHES:2007 (Hagedorn et al. (2008)) was shown to cover 97 percent of residential landline telephone numbers (Tucker, Lepkowski, and Piekarski

(2002)). The largest component of noncoverage bias in a telephone survey such as the NHES, whose sampling frame only includes landline phones, is probably due to the prevalence of households without landline telephones[1] and the differences between such households and those with landline telephones. Based on recent findings (Blumberg and Luke 2008), in the last 6 months of 2007, the percentage of households with no telephone service was about 2 percent, and the percentage of households with cell phone service alone was about 16 percent. Tucker et al. (2004) and Blumberg and Luke (2008) examined differences in characteristics among persons and households having no telephone service, cellular service only, and landline service (including both landline only, and landline and cellular). Although there are differences in landline noncoverage (e.g., young adults, adults in one-person households, renters, and Blacks and Hispanics are less likely to have landlines), statistical adjustments that account for these subgroup differences can reduce noncoverage bias.

This report documents an extensive Bias Study conducted in conjunction with the 2007 National Household Education Surveys Program (NHES:2007). The Bias Study was motivated by continuing declines in response rates and landline telephone coverage experienced by NHES and other RDD studies over time. Conducted for NCES, NHES:2007 was an RDD survey covering the 50 states and the District of Columbia. As discussed in chapter 3, the Bias Study sample was an area sample, selected independently of the NHES:2007 RDD sample. The sampled addresses for the Bias Study were matched to telephone numbers, and an attempt was made to gain cooperation (i.e., to complete an interview) by telephone when a telephone number was available. That is, households with a matched telephone number were first called by telephone interviewers in the Telephone Research Center (TRC). Those cases for which a Screener interview could not be completed by the end of the calling period through TRC-initiated calls were sent to the field for in-person follow-up. Households for which a telephone number match was not found went to the field for in-person follow-up without being called by TRC interviewers. As with the RDD sample, telephone data collection for the Bias Study sample began on January 2, 2007 and ended on May 6, 2007. In-person data collection began on March 19, 2007 and ended on June 24, 2007.

The purpose of the Bias Study is to investigate bias in the estimates due to unit nonresponse and noncoverage, through the use of field follow-up of cases for which an interview could not be completed by telephone. Following up with nonrespondents from the telephone effort allows an investigation of nonresponse bias, and following up with households with no landline telephone allows an investigation of noncoverage bias. This nonresponse study is limited because data on the households that did not respond to the Bias Study are not available. Thus, statements about the likely bias associated with

[1] Households without landline telephones include cellular phone-only households, in addition to households with no telephone service.

the nonresponse of these households cannot be evaluated directly, and inferences are based on model assumptions.

The analysis presented in this report differs from the standard approach to bias analyses suggested in Seastrom (2002) in that it involves a full-scale data collection effort directed entirely at estimating bias. The most common methods use existing data to evaluate bias and can be effective at detecting and helping to correct for it. Such methods have been used in the evaluation of bias in earlier NHES surveys. (See Brick (1996); Brick et al. (1997); Brick, Burke, and West (1992); Montaquila, Brick, and Brock (1997); Nolin et al. (2000); Nolin et al. (2004); and Roth, Montaquila, and Chapman (2007)). As a result, the current analysis complements earlier investigations, such as comparisons to estimates from other surveys with higher responses (e.g., chapter 8 in Nolin et al. (2004)). Those studies found little evidence of nonresponse bias or noncoverage bias in estimates from previous NHES surveys. [2]

The remainder of this chapter provides an overview of NHES and the procedures used to increase response rates and minimize the effects of nonresponse in the full RDD collections, as well as a description of previous feasibility studies that were conducted in preparation for the Bias Study. Chapter 2 describes the relationship between response rates and nonresponse bias, providing a theoretical framework for understanding nonresponse bias. Chapter 3 outlines the sample design and selection of the Bias Study sample, and chapter 4 describes the data collection process. Unit and item response rates for the Bias Study are provided in chapter 5, with some comparison to rates from the NHES:2007 RDD sample. Chapter 6 describes the process of creating weights and calculating standard errors for the analysis. The results of the bias analysis are provided in chapters 7 and 8, where chapter 7 gives an overview of bias, and chapter 8 addresses the components of bias. A final discussion is provided in chapter 9.

1.1 National Household Education Surveys Program

NHES is an RDD survey program developed by NCES in the Institute of Education Sciences, U.S. Department of Education. It is designed to collect information on important educational issues through telephone surveys of households in the United States. NHES has enabled NCES to gather data on a wide range of issues that cannot be measured efficiently in traditional institution-based data collections, such as early childhood care and education, children's readiness for school, parent

[2] A difference has been found between NHES and the Current Population Survey (CPS) for the estimated percentage of children in kindergarten through grade 12 whose parents' highest level of education is graduate school. The estimate from NHES has been consistently higher than that from the CPS.

perceptions of school safety and discipline, before- and after-school activities of school-age children, participation in adult and continuing education, parent involvement in education, school choice, homeschooling, and civic involvement. NHES uses computer-assisted telephone interviews (CATI) and has been conducted by Westat in 1991, 1993, 1995, 1996, 1999, 2001, 2003, 2005, and 2007.

NHES provides data on populations of special interest to NCES and education researchers. For surveys about children, the population of interest is defined by age or grade in school, or both, for the particular survey topic and research questions for a given survey administration. For surveys of adults, the population of interest is persons ages 16 and older who are not enrolled in grade 12 or below, excluding those on active duty military service and those who are institutionalized. NHES targets these populations using specific screening and sampling procedures.

NHES provides national cross-sectional estimates based on the 50 states and the District of Columbia. The NHES design also yields estimates for subgroups of interest for each survey, as defined by age or grade for children, educational participation status for adults, and Black and Hispanic origin for all populations of interest. In addition to providing cross-sectional estimates, NHES is also designed to provide estimates of change over time in key statistics.

NHES:2007 was conducted from January through May 2007. Households were randomly sampled, and a screening interview was administered to a household respondent age 18 or older. Demographic information collected in the Screener about household members was used to determine whether anyone was eligible for the School Readiness (SR), Parent and Family Involvement in Education (PFI), or Adult Education for Work-Related Reasons (AEWR) Surveys.

The SR Survey was administered to the parent or guardian[3] in the household who was most knowledgeable about the care and education of the sampled child; sampled children were ages 3 through 6, as of December 31, 2006, and were not yet in kindergarten.[4] The PFI Survey was also administered to the parent or guardian who was most knowledgeable about the care and education of the sampled child; sampled children were ages 20 or younger, as of December 31, 2006, and were enrolled or homeschooled in kindergarten through twelfth grade. The AEWR Survey was administered to sampled persons 16 years or older who were not enrolled in twelfth grade or below at the time of screening and were not institutionalized or on active duty in the U.S. Armed Forces. Although the AEWR data were not released to the public,[5] the AEWR Survey was administered in both the RDD and Bias Study in order to evaluate

[3] The respondent for the SR and PFI Surveys was identified by the Screener respondent as the household member most knowledgeable about the care and education of the sampled child. For ease of discussion, the respondent is referred to as the parent/guardian.
[4] Some SR Survey items were administered about children enrolled in kindergarten through second grade.
[5] A decision was made not to release the AEWR data because of the low overall response rate.

bias; this was deemed important because NHES has included adult education surveys in various survey administrations since 1991.

The largest component of nonresponse in most RDD surveys occurs when a household is first dialed and attempts are made to secure the household's participation in the survey. This stage is called the Screener in NHES, and the Screener unit response rates across all the administrations of the survey are given in table 1-1. Screener unit response rates in 1991 and 1993 were greater than 80 percent, but then fell in 1995 and 1996 (73 percent and 70 percent, respectively) due, at least in part, to changes that increased the length and content of the screening interview (Brick and Collins 1997). In 1999, the length and content of the Screener were revised to be more consistent with the earlier surveys, and the response rate rose to 74 percent. The Screener response rates for 2001 and 2003 declined (68 percent and 62 percent, respectively) despite the fact that the length and content of the Screener were similar to 1999. In 2003 a large incentive experiment was imbedded in the survey (Brick et al. 2005), and the results of this experiment led to the use of monetary incentives in the refusal conversion[6] stage of the Screener in 2005 (response rate of 64 percent). Despite the continued use of incentives in both an advance mailing and, where appropriate, a refusal conversion mailing, the Screener response rate declined to 53 percent in NHES:2007.

[6] Throughout this report, the term *refusal conversion* refers to the process of attempting to complete an interview with a case that has previously refused to participate. This often involves multiple call attempts and may result in contacting a household member other than the person who refused.

Table 1-1. Weighted unit response rates and percentage distribution of type of unit nonresponse for the NHES Screener:1991–2007

Year of survey	Number of completed Screeners	Overall unit response rate (percent)	Type of unit nonresponse (percentage distribution)		
			Refusals	Maximum calls	Other nonresponse
1991	60,322	81.0	84	7	9
1993	63,844	82.1	68	15	18[1]
1995	45,465	73.3	84	9	7
1996	55,838	69.9	83	10	7
1999	55,929	74.1	76	17	7
2001	48,385	67.5	74	18	8
2003	32,049	61.7	76	16	8
2005	58,140	64.2	77	15	8
2007	54,034	52.5	86	10	4

[1] The NHES:1993 percentage of other nonresponse cases is higher than that in other surveys. The lower rate of refusals and the generally higher response rate in NHES:1993 are indicative of the fact that less refielding of other nonresponse cases was needed prior to ending data collection with an acceptable Screener response rate.

NOTE: To avoid any differences in rates that might be attributable to the calculation method, all unit response rates given here were calculated using the business office method. Therefore, response rates given here are somewhat different than the official response rates cited later in this report and in other survey documentation. The official rates for 2001, 2003, and 2005 use the survival method. The official rate for 2007 uses the vendor-assisted method. See chapter 4 of Hagedorn et al. (2008) for details on the methods for computing response rates. The number of household members enumerated in each data collection differed according to the sample requirements of the topical surveys conducted in the specific year. Maximum call cases are those that received at least eight call attempts during which contact was made with a person on at least one occasion, yet the Screener was not completed. Other nonresponse includes cases with language problems, no-answer and answering machine calls (downweighted to reflect the appropriate proportion assumed to be residential), and other forms of nonresponse. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), selected years, 1991-2007.

Procedures that have been used to increase response rates in RDD surveys include the following:

- advance letters;
- incentives;
- one or more refusal conversion attempts;
- special mailings such as Federal Express prior to refusal conversion;
- increased numbers of call attempts;
- leaving messages on answering machines;
- special training of interviewers to avoid refusals;
- assigning refusal cases to specially trained refusal conversion interviewers; and
- effecting changes in the protocol for working the cases, such as increasing total time in the field.

All of these methods were used in NHES:2007. The specifics of the methods used in NHES: 2007 are described in section 4.1 of Hagedorn et al (2008).

1.2 Previous Feasibility Studies

Over the past several NHES survey administrations, an increasing array of methods has been used in an attempt to contact potential respondents and gain cooperation, as noted earlier. In order to evaluate an additional method for improving survey response, the NHES: 2005 Field Test included a test of the feasibility of conducting a national RDD survey with subsampling of RDD nonrespondents to be contacted for in-person interviews (see Westat 2004 for details). Further testing of the in-person follow-up approach was conducted during the NHES: 2005 main study data collection and NHES:2007 field test.

The goals of these feasibility tests were to determine whether an in-person component would improve response rates enough to make it a cost-effective strategy for future NHES surveys and to assess the feasibility of using in-person follow-up with nonrespondents and households without landline telephones to study nonresponse and noncoverage bias. The results of the initial feasibility study in 2005 were promising in some ways (field interviewers completed

41 percent of telephone maximum call cases and 42 percent of telephone refusal cases that were determined to be residential). However, some major operational issues were identified, including the limited utility of such an approach when the study protocol greatly limited which cases could be fielded for in-person collection.[7] The additional study conducted in conjunction with the NHES:2005 RDD collection examined operational issues and identified key factors needing further study. It also provided information on the refusal conversion rate for the cases that were not subject to the restrictions imposed in the NHES:2005 Field Test, as well as estimates that were not subject to the compressed schedule effects of the NHES:2005 Field Test. (The NHES:2005 Field Test was conducted over a 2-month period; this did not allow sufficient time for the full data collection protocol, e.g., a 13-day hold period prior to attempting refusal conversion, to be followed.)

For the study of in-person follow-up conducted with the NHES:2005 RDD collection, a subset of Screener cases in two predetermined sites were sent to the field after having been finalized on the initial refusal on the phone, after having been finalized on the third refusal,[8] and after having been finalized as maximum call or language problems. Of the 134 first refusal Screener cases sent to the field, 36 cases (27 percent) were completed in the field. Of the 206 third refusal Screener cases sent to the field, 48 cases (23 percent) were completed in the field. Among maximum call and language problem Screener cases, 8 of the 60 cases (13 percent) that were sent to the field were completed.

These studies demonstrated that field follow-up is feasible and is a viable approach for completing interviews with a proportion of both telephone nonrespondents and households without landline telephones. In preparation for both the full-scale Bias Study and the NHES: 2007 RDD collection, a field test of NHES:2007 was conducted in 2006. For the Bias Study, the primary purpose of the field test was as a final test of operational procedures and materials used during the field follow-up.

[7] In the 2005 Field Test, only refusals that were mild and had no more than one "knowledgeable" refusal were sent to the field for an in-person follow-up. A knowledgeable refusal was one in which the respondent who refused heard the entire study introduction prior to refusing, mentioned receiving and reading the advance letter, or otherwise acknowledged that he or she understood that the study was a legitimate survey and chose not to participate.

[8] In NHES:2005 and NHES:2007, a subsample of Screener cases was designated to receive an abbreviated telephone protocol. A random subsample of cases was designated to finalize after the first refusal, while the remaining cases were designated to receive the full telephone protocol (which included up to three refusals before finalization).

2. RELATIONSHIP BETWEEN RESPONSE RATES AND BIAS

This chapter examines some theory on the relationships between response rates and nonresponse bias. The same theory may also be applied to noncoverage rates, although it requires some re-conceptualization. The relationship between response rates and bias is more complex than the assumption that higher response rates will produce estimates with lower nonresponse bias. The chapter begins by giving some theory that aids in understanding the nature of this relationship. Two approaches that have been examined in dealing with nonresponse bias are presented, and the approach that is most pertinent for this discussion is considered in more detail. As the more pertinent approach is explicated, connections to theories of nonresponse are provided. The chapter concludes by reviewing estimation methods that might be used to reduce nonresponse bias and the conditions required for these methods to be effective.

2.1 Response Theories

Two approaches to viewing nonresponse in surveys consider response as either deterministic or stochastic. The deterministic view implies that the population can be partitioned so that every unit can be classified into respondent and nonrespondent strata, irrespective of whether the unit was sampled (Cochran 1977, pp. 361-362). The nonresponse bias of an estimated mean depends on the sizes of the strata and the differences in the characteristics in the two strata. A common way of describing the relationship between the response rate and nonresponse bias for the mean under this approach is

$$bias(\bar{y}_r) = (1 - rr)(\bar{Y}_r - \bar{Y}_m), \tag{2.1}$$

where $\bar{y}_r$ is the estimated mean based on the respondents, rr is the proportion of the population in the respondent stratum, $\bar{Y}_r$ is the mean of the stratum of respondents, and $\bar{Y}_m$ is the mean of the stratum of nonrespondents. For other statistics and estimators, the relationship varies and expressions like that given in (2.1) can be established.

The second approach takes a stochastic perspective and assumes that response to the survey is a random variable and that each unit has a response propensity or probability of responding, denoted ϕ_i. This response propensity model assumes that $\phi_i > 0$ for all *i*. When some units have zero response propensities, the response propensity model does not hold and these units must be treated as if they were not covered or using the deterministic approach. Under the response propensity model, nonresponse can be treated like a second phase of sampling (i.e., treating the nonrespondents as a subsample of the full sample), but an important difference is that response propensities, unlike sampling probabilities, are unknown.

Under the stochastic model, the bias of an estimate is related to both the distribution of the characteristic and the distribution of the response propensities. Using the methods given in Bethlehem (1988) and Kalton and Maligalig (1991), the bias of the respondent mean can be written as

$$\begin{aligned} bias(\bar{y}_r) &= \bar{\phi}^{-1}\sigma_\phi\sigma_y\rho_{\phi,y} \\ &= \bar{\phi}^{-1}\Sigma\left(\phi_i - \bar{\phi}\right)\left(Y_i - \bar{Y}\right)/N, \end{aligned} \tag{2.2}$$

where Y_i is the value of the characteristic *y* for unit *i*, $\bar{Y}$ is the population mean of the characteristic *y*, ϕ_i is the response propensity for unit *i*, $\bar{\phi}$ is the mean of the response propensities, σ_ϕ is the standard deviation of the response propensities, σ_y is the standard deviation of the characteristic *y*, $\rho_{\phi,y}$ is the correlation between the response propensities and the values of the characteristic, and *N* is the number of units in the population. Expression (2.2) shows that the respondent mean is unbiased if there is no correlation between the response propensity and the characteristic being estimated.

Both the deterministic and stochastic models imply that 100 percent response results in no nonresponse bias. However, some relationships between response rates and bias are more obvious using the stochastic model. For example, suppose it were possible to raise the response propensity for every unit by the same factor, from ϕ_i to $k\phi_i$, where $k > 0$ and $k\phi_i \leq 1$. Using (2.2), it is clear that this type of increase in response rate has no effect on the bias,[9] countering the assumptions that higher response rates necessarily result in estimates with lower nonresponse biases. In the next section, methods of estimating nonresponse bias using response propensity models are discussed.

[9] Note that if response propensities for every unit are increased by the factor *k*, then the average response propensity $\bar{\phi}$ will also increase by a factor of *k*; thus, the factor of *k* that appears in the numerator and denominator of expression (2.2) will cancel.

2.2 Estimating Nonresponse Bias and Bounds on the Bias

If the relationship between the response propensities and the statistic being estimated is known or can be estimated, then the nonresponse bias of the estimate can be approximated. Colombo (2000) and Groves, Presser, and Dipko (2004) have considered this relationship and examined some of the consequences for bias. To provide a clear example of this approach, only estimates of a proportion are considered here and the goal is to estimate the proportion of the population with a characteristic (*P*), say the proportion of preschoolers who participated in center-based arrangements in the previous year. (Note that the proportion of the population without the characteristic is expressed as 1-*P*.)

Since a proportion is a mean of a dichotomous variable (with the value of 1 indicating the presence of a characteristic and 0 indicating its absence), the bias of the unadjusted estimator of a proportion can be written using (2.2). However, for a proportion this expression can be further simplified. Let the average response propensity for the units with the characteristic be ϕ_1, and the average response propensity for those without the characteristic be ϕ_2. The bias in the unadjusted estimator, denoted $\hat{p}_r$, is

$$bias(\hat{p}_r) = P(1-P)(1-\lambda)\{P+(1-P)\lambda\}^{-1}, \tag{2.3}$$

where $\lambda = \phi_2\phi_1^{-1}$.

The bias depends only on λ, the ratio of ϕ_2 and ϕ_1. The following are observations based on (2.3):

- If the average response propensities are the same for those with and without the characteristic ($\lambda = 1$), then the estimate is unbiased irrespective of the response rate.[10]
- The bias is negative when $\lambda > 1$ (those with the characteristic have lower response propensities).
- The bias is positive when $\lambda < 1$ (those with the characteristic have higher response propensities).

[10] If $\lambda = 1$, then $bias(\hat{p}_r) = p(1-p)(1-\lambda)(p+(1-p)\lambda)^{-1} = p(1-p)\cdot 0\cdot(p+(1-p))^{-1} = 0$.

Table 2-1 gives the bias of an estimate and table 2-2 gives the relative bias of an estimate (bias divided by P) for different values of λ. Because relative bias gives an indication of the magnitude of the bias relative to the estimate itself (rather than an absolute measure), relative bias can be useful for comparisons across different levels of P and λ. To illustrate, consider a characteristic possessed by 25 percent of the population (P = 25 percent), and suppose those without the characteristic are 10 percent more likely to respond than those with the characteristic (λ = 1.1). Then

$$bias(\hat{p}_r) = 0.25(1-0.25)(1-1.1)(0.25+(1-0.25)1.1)^{-1} = -0.017,$$

and the relative bias is $bias(\hat{p}_r)/P = -0.017/0.25 = -0.07$.

Table 2-1 shows that the bias becomes larger as λ increases and when P is not extreme (close to 0 percent or 100 percent). For characteristics possessed by 50 percent of the population, the bias may be large if the ratio of the response propensities for the two groups is not close to 1. In terms of relative bias, table 2-2 shows that when P is small, the nonresponse bias may be large relative to the size of the estimate, even for modest values of λ. On the other hand, for P = 90 percent, the value of λ has to be large to result in a large relative bias.

Table 2-1. Bias in the unadjusted estimate of a percentage, by different ratios of response propensities ($\lambda = \phi_2\phi_1^{-1}$)

Percent of population with the characteristic (P)	Ratio of response propensities for those without the characteristic to those with the characteristic (λ)			
	1.1	1.5	2.0	2.5
1	-0.1	-0.3	-0.5	-0.6
5	-0.4	-1.6	-2.4	-2.9
10	-0.8	-3.1	-4.7	-5.7
25	-1.7	-6.8	-10.7	-13.2
50	-2.4	-10.0	-16.7	-21.4
75	-1.8	-8.3	-15.0	-20.5
90	-0.9	-4.3	-8.2	-11.7
95	-0.5	-2.3	-4.5	-6.6
99	-0.1	-0.5	-1.0	-1.5

NOTE: Response propensities for units with the characteristic = ϕ_1; those without the characteristic = ϕ_2.
SOURCE: Analytical derivation.

Table 2-2. Relative percentage bias (bias divided by the percent of the population with the characteristic, expressed as a percentage) for the unadjusted estimate of a percentage, by different ratios of response propensities ($\lambda = \phi_2 \phi_1^{-1}$)

Percent of population with the characteristic (P)	Ratio of response propensities for those without the characteristic to those with the characteristic (λ)			
	1.1	1.5	2.0	2.5
1	-9	-33	-50	-60
5	-9	-32	-49	-59
10	-8	-31	-47	-57
25	-7	-27	-43	-53
50	-5	-20	-33	-43
75	-2	-11	-20	-27
90	-1	-5	-9	-13
95	0	-2	-5	-7
99	0	0	-1	-1

NOTE: Response propensities for units with the characteristic = ϕ_1; those without the characteristic = ϕ_2.
SOURCE: Analytical derivation.

Since the main analysis in this report examines the existence of bias when an additional effort (in-person data collection) is attempted, the bias expressions are further developed to deal with this situation. Consider the ratio of the bias of the estimate for a survey conducted with a higher level of effort (say effort level = 2) to the bias for a survey conducted with a lower level of effort (effort level = 1). Using (2.3) and labeling the bias in the estimate using level of effort 1 as $bias(\hat{p}_{r1})$ and the bias using level of effort 2 as $bias(\hat{p}_{r2})$, the ratio of the biases is

$$\frac{bias(\hat{p}_{r2})}{bias(\hat{p}_{r1})} = \frac{(1-\lambda_2)(P+\lambda_1(1-\lambda_1)^{-1})}{P(1-\lambda_2)+\lambda_2}, \tag{2.4}$$

where $\phi_{1,1}$ is the average response propensity for those with the characteristic at the level of effort = 1, $\phi_{1,2}$ is the average response propensity for those with the characteristic at the level of effort = 2; $\phi_{2,1}$ and $\phi_{2,2}$ are defined similarly for those without the characteristic; and $\lambda_1 = \phi_{2,1} / \phi_{1,1}$, $\lambda_2 = \phi_{2,2} / \phi_{1,2}$. (Note that the expression is undefined if the $bias(\hat{p}_{r1}) = 0$.)

An easier way to understand (2.4) is to rewrite it as a percentage reduction in the bias of the estimate as a result of increasing the level of effort from level 1 to level 2. This percentage reduction of bias is

$$\kappa = 100 - 100\frac{bias(\hat{p}_{r2})}{bias(\hat{p}_{r1})} = 100 - \frac{100(1-\lambda_2)\left(P + \lambda_1(1-\lambda_1)^{-1}\right)}{P(1-\lambda_2)+\lambda_2}. \quad (2.5)$$

Notice that if increasing data collection effort changes the response rates, but does not change the ratios of the average response propensities ($\lambda_1 = \lambda_2$), then there is no reduction in the bias ($\kappa = 0$ percent). At the other extreme, suppose the added effort results in $\lambda_2 = 1$ and there is no bias in the estimate from the higher response rate survey, then $\kappa = 100$ percent.

Table 2-3 gives the percentage reduction in bias for different values of the population percentage (*P*) holding $\lambda_2 = 1.1$ and varying the value of λ_1. The table shows the percentage reduction in bias is not very sensitive to *P*. In addition, the percentage reduction is greatest when the effort level 1 survey estimate has a large value of $\lambda_1 = \phi_{2,1}/\phi_{1,1}$, as would be expected. It is worth noting that the bias due to nonresponse increases with higher response rates if $\lambda_2 > \lambda_1$ and $\kappa < 0$. For example, suppose $\lambda_1 = 1.2$ and $\lambda_2 = 1.4$, then $\kappa = -83$ percent, and the nonresponse bias increases as a result of the additional effort. This type of result might be unusual in practice, but not impossible.

Table 2-3. Percentage reduction in bias of estimate due to higher level of effort (κ), holding constant the ratio of response propensities at the higher level of effort (λ_2 =1.1) for different values of the ratio of response propensities at the lower level of effort (λ_1)

Percent of population with the characteristic *(P)*	Ratio of response propensities for those without the characteristic to those with the characteristic, at the lower level of effort (λ_1)			
	1.2	1.5	2.0	2.5
1	45	73	82	85
5	46	73	82	85
10	46	73	83	86
25	47	74	84	87
50	48	76	86	89
75	49	78	88	91
90	50	79	89	92
95	50	80	90	93
99	50	80	90	93

NOTE: Response propensities for units with the characteristic = ϕ_1, without the characteristic = ϕ_2, and the ratios are $\lambda_1 = \phi_{2,1}/\phi_{1,1}$ and $\lambda_2 = \phi_{2,2}/\phi_{1,2}$.

SOURCE: Analytical derivation.

At the time of deciding on the level of effort to expend in a survey, it may be useful to get a sense of what is feasible by obtaining a bound on the reduction in the bias. This can be done by assigning values for λ_1 and λ_2. Making reasonable assignments of these values depends on understanding the causes of nonresponse, especially causes that would result in response propensities that differ for those with and without the characteristic. Two general categories of causes of nonresponse are accessibility (ability to contact sampled units) and amenability (willingness of those contacted to respond). Mechanisms likely to give rise to different response propensities for those with and without the characteristic are those that are either a direct cause of the nonresponse or a variable highly correlated with a direct cause. For example, different response propensities due to inability to contact respondents might be expected in surveys estimating statistics such as travel or the use of technology to prevent unwanted telephone calls from reaching the household. Similarly, other characteristics, such as being in a single-person household, might also be highly correlated to differential response propensities due to inaccessibility because it is typically harder to make contact with households with only one person.

With respect to amenability, the topic and sponsorship of the survey are features that might cause differential response propensities for those with and without the characteristic. This hypothesis is consistent with leverage-saliency theory (Groves, Singer, and Corning 1999). Advance letters and introductions that identify the topic and sponsor might result in persons being more or less amenable to participate based on whether they have a specific characteristic. For example, households without school-age children may be less likely to respond to a survey on education. Groves, Presser, and Dipko (2004) conducted some experiments using persons with known characteristics and found some support for this hypothesis, but the differences in response propensities for those with and without the characteristic were typically not large.

2.3 Estimation Methods To Reduce Nonresponse Bias

The relationships between response propensities and nonresponse bias presented earlier assume that the estimator is not subject to any nonresponse adjustments. In many surveys, auxiliary data are used in either standard nonresponse adjustment weighting or calibration weighting. The main goal of these adjustments to the base weights, which are the inverse of the selection probabilities, is often reduction in nonresponse bias or noncoverage bias, or both. This section explores the use of these adjustments and the effect the adjustments have on nonresponse bias under the response propensity model perspective. For additional information about these types of adjustments, see Brick and Kalton (1996), Kalton and Maligalig (1991), and Lundstrom and Särndal (1999).

Response propensity models are often explicitly used to develop nonresponse adjustments in surveys. Little (1986) suggested estimating response propensities and using them to create nonresponse weighting cells. He calls estimators that are formed this way *response propensity stratification estimators*. The general approach is described in Brick and Kalton (1996) within the context of other weighting adjustment methods. Recent examples of the use of propensity models in telephone surveys are Smith et al. (2004) and Blenk and Stasny (2001).

Bethlehem (1988) and Kalton and Maligalig (1991) examined the statistical implications of different estimation procedures under the response propensity model of nonresponse. In particular, they examined the bias of the estimator when auxiliary variables are used in an attempt to reduce the bias of the estimator. Some theory of estimation in this case is provided below.

The generalized regression estimator (GREG) is an estimator that uses auxiliary variables and is a valuable one to consider because calibration estimators such as the poststratified and raking estimators are asymptotically equivalent to the GREG (Deville and Särndal 1992). When all the sampled units respond, the GREG estimator of the mean, $\bar{y}_{GR}$, is

$$\bar{y}_{GR} = \bar{y}_{HT} + (\bar{X} - \bar{x}_{HT})'\hat{\beta}, \tag{2.6}$$

where the subscript *HT* indicates the Horvitz-Thompson, or inverse selection, weighted estimator (e.g., $\bar{y}_{HT} = \sum_{i \in s} \pi_i^{-1} y_i / N$ with π_i the probability of selection for unit *i*, y_i the value of the characteristic *y* for unit *i*, *s* the set of units in the sample, and *N* the total number of units in the population); $\bar{X}$ is a *p*-vector of population means of auxiliary variables; $\bar{x}_{HT}$ is the Horvitz-Thompson estimator of $\bar{X}$; $\hat{\beta}$ is the *p*-vector of weighted regression coefficients; and *p* is the number of auxiliary variables. When some units do not respond, a modified estimator is

$$\bar{y}^*_{GR} = \bar{y}^*_{HT} + (\bar{X} - \bar{x}^*_{HT})'\hat{\beta}^*, \tag{2.7}$$

where the * indicates the estimator is based only on the values of the unit respondents[11] (e.g., $\bar{y}^*_{HT} = \sum_r \pi_i^{-1} y_i / \sum_r \pi_i^{-1}$, where the sums are over the respondents).

[11] Expression (2.7) assumes that all unit respondents have valid responses to all items used in the estimator. As such, the values used in (2.7) include reported values for item respondents and imputed values for item nonrespondents.

Following Bethlehem (1988) the bias of (2.7) for a poststratified estimator as an estimator of the mean is

$$bias(\bar{y}^*_{GR}) = \bar{X}'\beta^* - \bar{Y}\,, \tag{2.8}$$

where β^* is the vector of population regression parameters based on unit respondents.

Expression (2.8) can be expressed in different forms for different estimators. Expression (2.2) is the simplification of (2.8) when there are no auxiliary variables (X = 1). The poststratified estimator (more appropriately this might be called the population weighting cell estimator as discussed in Brick and Kalton (1996)) is

$$\bar{y}^*_{ps} = \sum_c \frac{N_c}{N} \frac{\sum_r y_{ci}\pi^{-1}_{ci}}{\sum_r \pi^{-1}_{ci}} = \sum_c \frac{N_c}{N}\bar{y}_{r,c}\,, \tag{2.9}$$

where c = 1,...,C are the poststratification cells,[12] N_c is the number of units in the population in cell c, and $\bar{y}_{r,c}$ is the estimated mean in cell c based on the respondents only. The bias of the poststratified estimator given in (2.9) is

$$\begin{aligned} bias\left(\bar{y}^*_{ps}\right) &\approx \sum_c W_c \bar{\phi}_c^{-1} \sigma_{\phi_c} \sigma_{y_c} \rho_{\phi_c, y_c} \\ &= N^{-1} \sum_c \left(\phi_{ci} - \bar{\phi}_c\right)\left(Y_{ci} - \bar{Y}_c\right)/\bar{\phi}_c\,, \end{aligned} \tag{2.10}$$

where $W_c = N_c / N$.

NHES uses a raking estimator to take advantage of a larger number of auxiliary variables than is feasible with poststratification because the number of respondents in the cells becomes sparse. For simplicity, a raking estimator with two dimensions or margins (denoted as c and d) is defined below, but the estimator can be easily extended to more dimensions. The raking estimator is

$$\bar{y}^*_{rk} = \sum_c \sum_d \tilde{w}_{cd}\bar{y}_{r,cd}\,, \tag{2.11}$$

[12] Note that the subscript "c" denotes the particular cell, whereas the constant "C" symbolizes the total number of poststratification cells. All c's appearing in the expressions given here are "c" denoting the cell.

where $\bar{y}_{r,cd}$ is the estimated mean in cell *cd* based on respondents only, and $\tilde{w}_{cd}$ is an estimate of $W_{cd} = N_{cd} / N$ (where N_{cd} is the number of population units in cell *cd*) formed by raking to the known marginal totals, N_c and N_d .

The bias of the raking estimator is discussed in Kalton and Maligalig (1991). Two sufficient conditions for the raking estimator to be approximately unbiased in the presence of unit nonresponse are

$$\begin{aligned} &(a) \quad N_{cd}^{-1} \sum \left(\phi_{cdi} - \bar{\phi}_{cd}\right)\left(Y_{cdi} - \bar{Y}_{cd}\right) / \bar{\phi}_{cd} = 0 \\ &(b) \quad \bar{\phi}_{cd} = \left(\alpha_c \beta_d\right)^{-1}. \end{aligned} \tag{2.12}$$

Both conditions must hold at the same time in order for these conditions to be sufficient. The first condition is the poststratification condition (2.10), but in this case the covariance term is the covariance within the cell defined by the full cross-classification of all the raking dimensions, e.g., the combination of the level of the first dimension and the level of the second dimension that defines cell (*c*,*d*). For the two-dimensional case, the covariance between the response propensities within cell (*c*,*d*) and the variable values in the cell is equal to zero. The second condition requires that the mean response propensity for a cell of the full cross-classification can be written as a product of factors (main effects) for the dimensions. This implies the estimate will be biased if the response propensities involve an interaction effect as well as the main effects for each of the dimensions.

The auxiliary variables used in the adjustments are assumed to be from an independent source, to have negligible sampling and measurement error, and to be available for the entire population. However, Lundström and Särndal (1999) show that standard nonresponse adjustment methods that only use data from the sample, such as weighting class nonresponse estimators, have similar bias properties to those that use population data. Thus, most of the expressions for bias are approximately valid when the same weighting procedures are used with sample data. For example, the bias of the nonresponse weighting class estimator is approximately equal to the bias of the poststratified estimator (Brick and Kalton 1996).

To illustrate the role of auxiliary variables in weighting to control bias, the bias of the poststratified estimator is considered further. Without poststratification, the estimator is unbiased only if the response propensities are constant, the values of the characteristic *y* are constant, or there is no correlation between the two. With poststratification, expression (2.10) shows the estimator is unbiased if the response propensities are constant within the poststrata cells, if the *y* value is constant within the cells,

or if there is no correlation between the response propensities and the y values within cells. Thus, if the cells account for variability in either the values of the ϕ's or the y's, then the poststratified estimator will be less biased than the unadjusted estimator. Even if the cells are not well chosen for either of these purposes, it is possible that the correlation between the y values and the ϕ's within cells will be smaller than the overall correlation. Again, the result is a reduction in the bias of the estimates when the poststratification variables are reasonably related to the characteristics estimated.

These arguments indicate that using data available either from the sampling frame or from independent sources can reduce the bias due to nonresponse. For the weighting adjustments to be effective at reducing the bias, the variables used in the adjustment should be related to either the probability of responding, the characteristics being estimated, or the correlation between the two. Even if the relationships between the auxiliary variables and the response propensities and the characteristics being estimated are not strong, the adjustments may reduce bias by attenuating the correlation. Thus, a reasonable strategy for bias reduction is to choose as large a number of auxiliary variables as possible in the adjustment. The implications of using a large number of variables on the variance of the estimates must also be considered, and some methods are more suitable for attaining both bias and variance reduction than others. For example, using response propensity scores is one way to include a large number of auxiliary variables in the adjustment. Raking is an estimation method suitable when there are many variables available to be used in adjustments. For further discussion of these topics, see, Brick and Kalton (1996), Little (1986) and Lundström and Särndal (1999).

This page is intentionally blank.

3. SAMPLE DESIGN AND SELECTION FOR THE BIAS STUDY

3.1 Overview

A nationally representative three-stage sample of 7,500 households was selected for the NHES:2007 Bias Study. The three stages of selecting households are described in sections 3.2.1 to 3.2.3. Within sampled households, children and adults were then sampled for the School Readiness (SR), Parent and Family Involvement in Education (PFI), and Adult Education for Work-Related Reasons (AEWR) surveys using the within-household sampling algorithm developed for the main NHES:2007 random digit dialing (RDD) collection. The sample sizes for the Bias Study were set to allow for detection of a 5 percentage point bias in key statistics from each of the surveys. Within-household sampling is discussed in section 3.2.4.

3.2 Bias Study Sample Design

3.2.1 Primary Sampling Unit (PSU) Selection

At the first stage of household sample selection, 30 PSUs, defined as single counties or groups of a few contiguous counties, were randomly selected from the 50 states and the District of Columbia with probabilities of selection proportional to size. The measure of size used for PSU selection was the PSU population estimate for July 1, 2004, produced by the Census Bureau's Population Estimates Program. One PSU was large enough that it was identified as a certainty PSU (i.e., it was brought into the sample with probability 1). The noncertainty PSUs were stratified by metropolitan status and, for metropolitan areas, further by census division and by educational attainment, as measured by the proportion of adults having a bachelor's degree or higher. These characteristics were used for stratification because they are related to many of the survey characteristics of interest in NHES. In total, 14 strata were created so that each had approximately the same aggregate measure of size, where the stratum size is the sum of the measure of size of PSUs within the stratum. The strata definitions are provided in exhibit 3-1. Within each stratum, two PSUs were randomly selected with probabilities proportionate to the measure of size.[13]

[13] In one stratum, 3 PSUs were selected to achieve the total of 30 sampled PSUs (29 noncertainty PSUs and 1 certainty PSU).

Exhibit 3-1. Strata used for PSU selection for the NHES:2007 Bias Study

Stratum	Stratum definition	Total stratum measure of size
1	Non-metropolitan	19,767,100
2	Metropolitan; New England, East North Central, and West North Central census divisions; percentage with a bachelor's degree or higher is less than 22.800	29,131,311
3	Metropolitan; New England, East North Central, and West North Central census divisions; percentage with a bachelor's degree or higher is greater than or equal to 22.800 and less than 29.100	21,981,207
4	Metropolitan; New England, East North Central, and West North Central census divisions; percentage with a bachelor's degree or higher is greater than or equal to 29.100	21,835,548
5	Metropolitan; Middle Atlantic census division; percentage with a bachelor's degree or higher is less than 24.310	20,035,322
6	Metropolitan; Middle Atlantic census division; percentage with a bachelor's degree or higher is greater than or equal to 24.310	19,480,080
7	Metropolitan; South Atlantic, East South Central, and West South Central census divisions; percentage with a bachelor's degree or higher is less than 15.130	19,356,038
8	Metropolitan; South Atlantic, East South Central, and West South Central census divisions; percentage with a bachelor's degree or higher is greater than or equal to 15.130 and less than 20.775	19,355,261
9	Metropolitan; South Atlantic, East South Central, and West South Central census divisions; percentage with a bachelor's degree or higher is greater than or equal to 20.775 and less than 25.280	19,726,185
10	Metropolitan; South Atlantic, East South Central, and West South Central census divisions; percentage with a bachelor's degree or higher is greater than or equal to 25.280 and less than 29.500	18,950,774
11	Metropolitan; South Atlantic, East South Central, and West South Central census divisions; percentage with a bachelor's degree or higher is greater than or equal to 29.500	19,412,564
12	Metropolitan; Mountain census division	18,336,012
13	Metropolitan; Pacific census division; percentage with a bachelor's degree or higher is less than 26.960	18,460,250
14	Metropolitan; Pacific census division; percentage with a bachelor's degree or higher is greater than or equal to 26.960	18,564,462

SOURCE: Retrieved from http://www.census.gov/population/estimates/metro_general/List1.txt, (3/3/2006); Census Bureau's Population Estimates Program, 2004.

3.2.2 Segment Selection

At the second stage of household sample selection, 10 area segments were selected within each sampled PSU with probabilities of selection proportional to size. The measure of size for segment selection was the number of occupied housing units in the segment, as reported in the 2000 decennial census. Segments were generally census blocks or block groups, but small block groups were combined with other block groups when necessary to form segments of sufficient size. A minimum segment size of 100 occupied housing units was set in an effort to ensure the desired number of addresses per segment could be attained. Another goal of having a relatively large segment was to reduce the effects of clustering on the variance of estimates.

3.2.3 Address Selection

At the third stage of household sample selection, a two-phase sampling process was used to select addresses to obtain a final sample size of 250 addresses in each PSU. Lists of residential addresses were purchased from a vendor who maintains address lists based on the U.S. Postal Service delivery files. Since the vendor provides address lists by ZIP code, addresses were obtained for all ZIP codes within the sampled segments. Each address was then geocoded to identify the census block containing the address. Addresses located within census blocks that were included in the sample segments form the frame for address selection. In the first phase of address selection, a sample of 50 addresses was selected within each sampled segment, when possible. If fewer than 50 addresses from the vendor-provided list matched to the sampled segment, then all addresses in the segment were selected for the first phase sample.[14]

The group of addresses sampled in the first phase was sent to a second commercial vendor to be matched to white pages telephone directory listings to obtain telephone numbers, where possible. Overall, 59 percent of the first phase sample addresses had matching telephone numbers. This rate varied considerably by segment, ranging from 0 percent to 90 percent. In the second phase of sampling, within each sampled segment, addresses with telephone number matches were sampled at twice the rate of addresses without telephone number matches. The oversampling of addresses with telephone number matches was done to ensure a sufficient number of cases could be attempted by telephone. An equal number of addresses was selected within each segment in the PSU, for a total of 250 addresses per PSU.[15]

[14] This occurred in fewer than 5 percent of segments.

[15] In most cases, 25 addresses were selected within each of the 10 segments in the PSU. However, in 7 PSUs, the address lists contained fewer than 25 addresses in a particular segment. In this situation, the sample sizes in the other segments in the PSU were increased to achieve the target of 250 sampled addresses per PSU.

3.2.4 Within-Household Sampling and Precision Requirements

For each sampled address, the primary goal was to administer a screening interview to a household respondent age 18 or older.[16] As described below, the household could be contacted by phone or in person. Demographic information about household members collected in the Screener was used to determine whether anyone was eligible for the SR, PFI, or AEWR surveys. Up to three eligible persons (one per survey) could be sampled for each participating household. The within-household sampling algorithm used for the Bias Study was the same as that used for the RDD sample. The SR Survey was administered to the parent or guardian[17] in the household who was most knowledgeable about the care and education of the sampled child; sampled children were ages 3 through 6, as of December 31, 2006, and were not yet in kindergarten.[18] The PFI Survey was also administered to the parent or guardian who was most knowledgeable about the care and education of the sampled child; sampled children were ages 20 or younger, as of December 31, 2006, and were enrolled or homeschooled in kindergarten through twelfth grade. The AEWR Survey was administered to sampled persons 16 years or older who were not currently enrolled in twelfth grade or below and were not institutionalized or on active duty in the U.S. Armed Forces.

The sample sizes for the Bias Study were set to allow for detection of a 5 percentage point difference (or bias) in key statistics from each of the surveys.[19] For example, if the work-related adult education participation rate from the NHES:2007 RDD survey was 40 percent, and the participation rate from the Bias Study was 45 percent, such a difference would be expected to be statistically significant, and the difference would be attributable to bias. Detection of a bias of 5 percentage points was set as the criterion because smaller differences are generally of less substantive importance in NHES.

Based on address-telephone number match rates attained in NHES:2005, it was expected that about 60 percent of cases sampled for the Bias Study (or 4,530 of the 7,500 sampled addresses) would be attempted in the field because no matching telephone number would be identified or the case would not be completed through a telephone call initiated by an interviewer in the Telephone Research Center. Among cases attempted in the field, it was expected that Screeners would be completed with about 50

[16] Any household member age 18 or older was eligible to respond to the screening interview. However, if there were no household members ages 18 or older, the male or female head of the household was asked to complete the Screener. Household members were defined as persons who considered that household as their residence, kept their possessions there, and had no other place to live.

[17] The respondent for the SR and PFI Surveys was identified by the Screener respondent as the household member most knowledgeable about the care and education of the sampled child. For ease of discussion, the respondent is referred to as the parent/guardian.

[18] Some SR Survey items were administered about children enrolled in kindergarten through second grade.

[19] The key statistics from the SR survey that were selected in order to determine necessary minimum sample sizes include participation in center-based care arrangements, recognition of all colors, ability to count higher than 10, knowing all letters, and ability to write own name. Key statistics for the PFI survey include parent participation in three or more activities in the child's school, parent participation in home learning activities, and parent assessment of school practices. Key statistics for the AEWR survey include participation in adult education for work-related reasons and participation in employer-supported adult education.

percent based on the experiences in the NHES:2005 Field Test and the study of in-field follow-up conducted in conjunction with NHES:2005 RDD collection. This expectation took into account the longer field period of and the higher incentive used in the Bias Study.

The initial target was a total of 1,144 completed extended interviews (344 SR interviews, 400 PFI interviews, and 400 AEWR interviews), assuming unit response rates of 90 percent, 83 percent, and 80 percent for the SR, PFI, and AEWR surveys, respectively.[20] However, aiming for these targets would have required changing the sampling algorithm used for the NHES:2007 RDD study substantially to restrict the number of persons sampled for the PFI and AEWR survey for the bias analysis. Additionally, prior to releasing cases for in-field follow-up, an option was under consideration in which Bias Study cases would be combined with RDD cases in the preparation of public-use data files. Thus, it was decided to use the same within-household sampling algorithm for the Bias Study that was used in the RDD survey. These within-household sampling rates were expected to yield 2,682 completed extended interviews (327 SR interviews, 1,108 PFI interviews, and 1,247 AEWR interviews).

The first step in the within-household sampling process was to enumerate the members of the households. Following the enumeration, if the households had at least one preschooler, then exactly one was randomly sampled for the SR survey. If the household had at least one child ages 3 through 20 enrolled in kindergarten through twelfth grade or homeschooled, then exactly one was randomly sampled for the PFI survey. For each survey, numbers pre-assigned at the household level were used to determine which child in the household should be sampled from among all children in the household eligible for the survey.

Households were designated for adult sampling based on a random number. In households in which an adult was to be sampled, adult education participants had twice the probability of selection of nonparticipants. Table 3-1 shows all possible household compositions for sampling adults based on the presence of children in the household and adult education participation status as reported by the Screener respondent; the table also gives the respective domain probabilities of selection for adults or the likelihood that an adult would be selected, given the composition of his or her household. The maximum rate at which adults in households without children were sampled was 55 percent. That is, in 45 percent of households without children, no adult was sampled.

Exhibit 3-2 summarizes key design features of the Bias Study.

[20] These expected extended interview unit response rates are slightly higher than the rates attained in recent NHES surveys of the same or similar subpopulations, because in-person interviews generally attain higher unit response rates than telephone interviews (Hox and de Leeuw 1994; Aquilino and Wright 1996; Leon et al. 2003).

Table 3-1. Overview of the sampling scheme for selecting adults based on household composition: NHES:2007

Child in household	Household composition: Adult education participant	Household composition: Adult education nonparticipant	Domain probability of selection: Adult education participant	Domain probability of selection: Adult education nonparticipant
No		✓	0	0.2728
No	✓		0.5456	0
No	✓	✓	0.3637	0.1819
Yes		✓	0	0.1364
Yes	✓		0.2728	0
Yes	✓	✓	0.1819	0.0909

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Exhibit 3-2. Key design features of the NHES:2007 Bias Study

Characteristic	
Type of sample	Address sample
Mode of data collection	CATI (originating in Telephone Research Center) for cases finalized in Telephone Research Center; CATI (via cell phone or home phone) for cases attempted in the field
Instrument	Expanded Screener (see section 4.2) and standard NHES:2007 extended interviews
Respondent	Standard NHES respondents
Cases attempted in the field	Follow-up with telephone nonrespondents and telephone nonmatches
Number of PSUs (sites)	30
Number of screener cases attempted (total across sites)	7,500
Expected number of Screeners completed by Telephone Research Center-initiated call	2,970
Expected number of Screeners completed in field	2,265
Expected number of completed extended interviews (total across sites)	2,682

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

4. BIAS STUDY DATA COLLECTION

This chapter provides a detailed description of the data collection procedures for the Bias Study. It describes the telephone interviewing procedures for Bias Study cases, the recruitment and training of Bias Study interviewers, case priorities, procedures designed to increase respondent cooperation, special procedures for language problem and refusal cases, and refielding of nonresponse cases. A summary of the process can be found in exhibit 4-1.

4.1 Procedures for Bias Study Cases Prior to In-Person Efforts

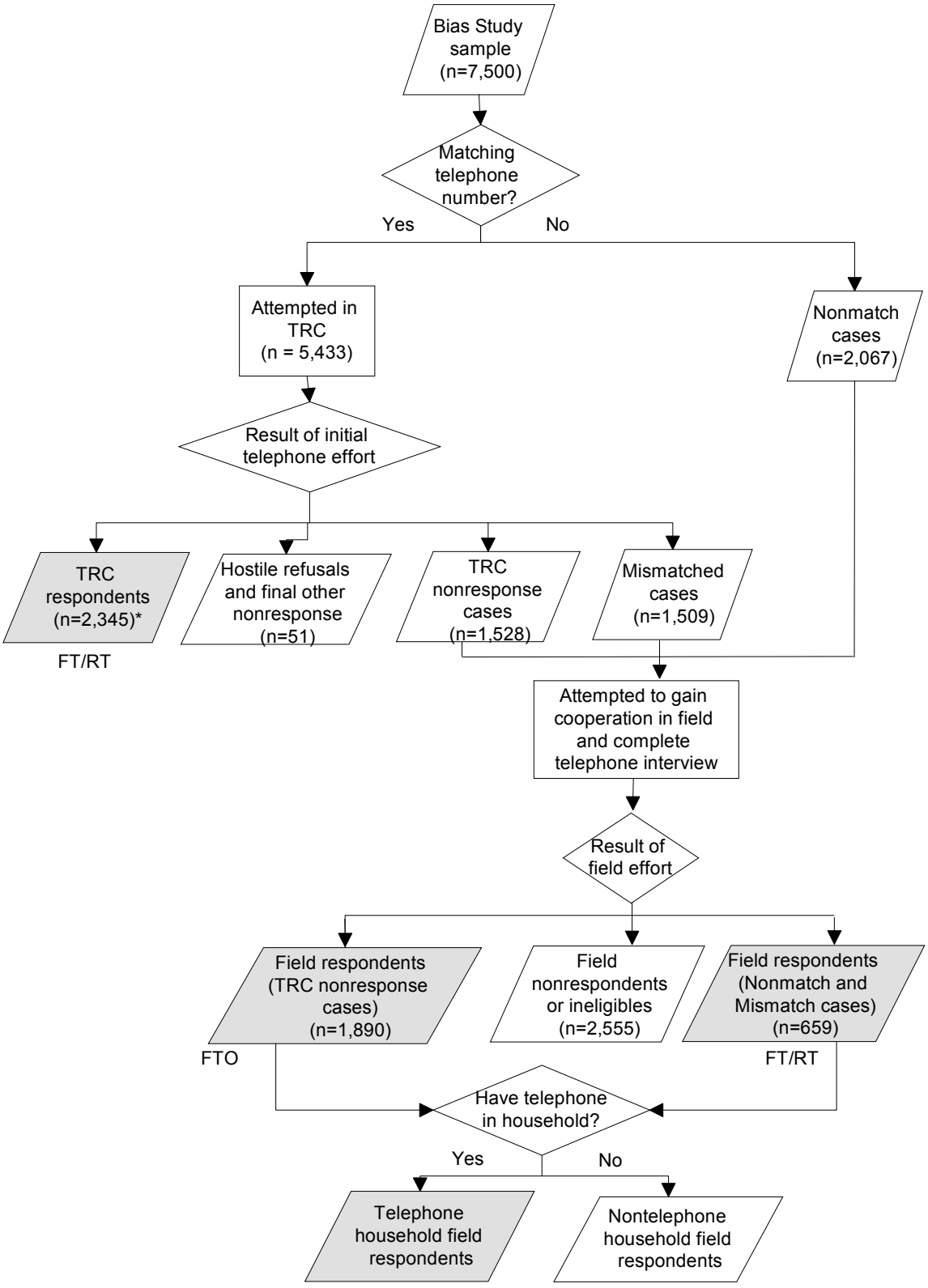
As described in section 3.2.3, all addresses in the first phase sample for the Bias Study were sent to a vendor to be matched with a telephone number. Addresses that were matched to telephone numbers were subsampled at about twice the rate of nonmatched addresses to arrive at the final (second phase) sample of addresses. In all, the sample consisted of 5,433 addresses matched to a telephone number and 2,067 cases that were not matched. The in-field procedures for the nonmatch cases are discussed in section 4.2. In order to evaluate nonresponse bias, cases that were matched with a telephone number were first attempted by telephone from the Telephone Research Center (TRC). These cases followed the same telephone interviewing protocol as NHES:2007 random digit dialing (RDD) cases. All nonhostile[21] nonresponse cases and cases that were found to be incorrectly matched to a telephone number or potentially incorrectly matched to a telephone number were sent for in-person follow-up. The telephone procedures are discussed in the next section. The non-telephone matched addresses were sent to the field for in-person efforts without first being tried in the TRC.

4.1.1 Initial Contact Procedures Prior to In-Person Efforts

The TRC attempted to complete an interview with all households for which a telephone number had been matched to an address sampled for the Bias Study. Prior to calling any of the matched households, a letter was sent on U.S. Department of Education stationery explaining the purpose of the call with a $2 cash incentive enclosed to draw attention to the importance of the study. The advance letter provided information about the study, its sponsorship, and its purpose (appendix A). Then, using the same

[21] Nonhostile cases are those that were not deemed abusive or profane.

Exhibit 4-1. Data collection process for household Screeners: NHES:2007 Bias Study sample



* Includes 109 potential mismatches and 1 RDD duplicate that were not sent to the field.
TRC: Telephone research center; FT/RT: Full treatment and reduced treatment; FTO: Full treatment only;
n: Number of households

telephone interviewing protocol followed for the NHES:2007 RDD sample, Bias Study cases were called by a TRC interviewer to identify households with eligible respondents. The interviewer was unaware whether the case was from the RDD sample or Bias Study sample. Once a household was reached, the interviewer administered a brief screening interview (referred to hereafter as the Screener) to a member of the household age 18 or older.[22] The Screener responses determined if any of the household members were eligible for the SR, PFI, or AEWR surveys, and the within-household sampling algorithm was used to sample persons for the extended interview surveys (see section 3.2.4).

Just as with the RDD sample, TRC-initiated telephone data collection for the Bias Study sample began on January 2, 2007 and ended on May 6, 2007.

4.1.2 Assigning Cases to Telephone Interviewers

For Bias Study cases that were matched to a telephone number and first attempted in the TRC, the same calling scheme used for RDD cases was used. That is, cases were prioritized for efficiency as follows:

- cases that had specific appointments;
- cases that had resulted in busy signals 15 minutes earlier;
- cases that had resulted in noncontact at a scheduled appointment time;
- cases that had unspecified appointment/general callback times for the time period;
- cases that had not been contacted on previous attempts and had not been attempted during the time period; and
- initial cases.

Initial attempts to contact households and determine the presence of household members eligible for extended interviews were conducted in two groups separated by a one-week hold period: a group of four calls consisting of two evening calls, one daytime call, and one weekend call; and a group of three calls, consisting of two evening calls and a weekend call on a different day than the previous weekend call. If contact had not been made with either a household member or an answering machine

[22] In rare cases, a household may have no members ages 18 or older. In these cases, the Screener was administered to the male or female head of household.

after these two sets of calls, the case was sent to a vendor for 14 additional calls to be made by predictive dialing.[23] If contact had not been made with a household member but an answering machine had been reached, the cycles of four calls and three calls were repeated. All cases that were no answer-answering machine cases were randomly subsampled to receive a total of 21 or 28 call attempts.[24]

Once a household member was contacted, up to 20 call attempts were made to complete the Screener with a household member, except in the case of language problem or refusal cases, described below. Once a household member was sampled as the subject of an extended interview, up to 20 call attempts were made to complete the interview with the identified parent/guardian respondent (for the SR and PFI surveys) or the sampled adult (for the AEWR survey).

When a Screener was completed and household members were selected for extended interviews, the interviewer would first attempt to complete any interviews for which the Screener respondent was selected, because he or she was already on the telephone. If other household members were selected, the interviewer asked to speak with them after completing any applicable interviews (or making a callback appointment) with the Screener respondent. Telephone callback attempts were made as necessary to make contact with respondents to extended interviews.

Non-English language/language problem cases. When English-only interviewers encountered a case in which the respondent indicated he or she did not speak English or had a hearing or speech impairment, they attempted to ascertain whether any adult household member spoke English or could communicate clearly enough to respond to the interview. If they were not successful, the case was coded one of three interim language problem statuses: hearing/speech problem, probable Spanish language, or another language. Specially trained interviewers recontacted the hearing/speech problem cases and attempted to complete an interview. Bilingual interviewers recontacted the Spanish language cases. Cases coded as non-English and non-Spanish were available to all interviewers, who recontacted the household in an effort to identify an English- or Spanish-speaking household member. If a Spanish-speaking household member was identified, the case was recoded as a Spanish language case and made available to bilingual interviewers.

[23] Predictive dialing is a process in which telephone numbers are automatically dialed and are routed to an attendant or operator when a telephone number is answered. The attendant identifies him or herself as an interviewer for the subcontractor and asks if the telephone number is for residential or business use. Calls resulting in no contact are not routed to an attendant or operator; they are automatically handled and classified as noncontact by a computer system.

[24] The variation in number of attempts was introduced initially for the purpose of survival method to estimate residency rates. However, the survival method was not ultimately used.

Refusal conversion. Whenever a refusal occurred, the interviewer recorded general demographic information about the refusing respondent (e.g., sex, approximate age) and the respondent's reasons for refusing to participate if any had been given. Interviewers also rated the strength of the refusal as mild, firm, or hostile. Although the distinction between the mild and firm classifications is subjective, these two classes of refusals receive the same contact protocol; the distinction simply serves to inform future interviewers of the nature of the refusals. In the NHES:2007 Bias Study, mild or firm refusal cases were released after a 13-day hold for a conversion attempt. TRC supervisors reviewed all cases coded as hostile to determine whether that designation was merited. Any cases rated as hostile that were judged by the supervisor to be inappropriately coded were recoded to firm refusals and were eligible to be released for a conversion attempt. Truly hostile (profane or abusive) refusal cases were never released for conversion. In addition, households that contacted the National Center for Education Statistics (NCES) directly and declined to participate were excluded from refusal conversion.

4.1.3 Bias Study Cases Sent for In-Person Efforts

Of the 5,433 Bias Study cases attempted by the TRC, 2,235 were completed in the TRC. Another 42 cases were coded as hostile refusals and 9 were finalized as other nonresponse (e.g., the only member of the household was suffering from dementia as reported by the full-time nurse who answered the call) in the TRC and were not sent for in-person efforts. Also, in 115 cases, respondents gave a slightly different address than the sampled address or the respondent refused to provide the household's physical address so the address could not be confirmed. A total of 23 of these 115 potential mismatches were initially sent to the field for address-telephone number verification. Later, a decision was made not to send the remaining 92 cases out to the field based on time constraints and the results of the subsample of 23 cases sent to the field; approximately 74 percent (17 out of 23) were verified as correct address-telephone matches and the other 6 were incorrect matches. Based on the results of the subsample of 23 cases sent to the field, the 109 potential mismatch cases (17 verified as correct in the field plus 92 not sent out) were ultimately classified as telephone respondents. A total of 2,378 out of 5,433 cases with telephone numbers were not sent for in-person efforts (2,235 completes, 42 hostile refusals, 9 other nonresponse, and 92 potential mismatch cases).

The 5,122 cases sent to the field included the remaining 3,055 cases first attempted in the TRC and the 2,067 cases without a telephone match. Table 4-1 presents the distribution of nonmatch, mismatch, nonresponse, and RDD duplicate cases (discussed in detail below) sent for in-person follow-up.

Table 4-1. Distribution of Bias Study cases sent for in-person efforts: NHES:2007 Bias Study

Cases sent for in-person data collection	Number
Total	5,122
Nonmatch cases (address not matched to telephone number)	2,067
Cases attempted but not completed by the TRC	3,055
Mismatched cases	
Incorrect residential telephone number match	108
Nonworking or nonresidential telephone number	1,394
Potential address-telephone number mismatch	23
Nonresponse cases	
Language problem	48
Maximum call	477
Noncontact	310
Nonhostile refusal	693
RDD duplicate cases	2

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Cases sent for in-person data collection included four kinds of cases: (1) address cases not matched to a telephone number, (2) address cases incorrectly matched to a telephone number, (3) nonresponse cases such as language problem cases, maximum call cases, noncontact cases, and refusal cases, and (4) a small number of cases that were duplicate RDD sample cases. The following describes each in turn:

Nonmatch cases were those cases for which a telephone number could not be matched to a sampled address (2,067 cases).

Mismatched cases include the following:

- **incorrect residential telephone match cases** (108 cases) in which the address provided by a respondent during the telephone interview was completely different from the sampled address;[25]

- addresses matched to **nonworking or nonresidential** telephone numbers (1,394 cases); and

- **potential address-telephone mismatches** (23 were sent for in-person follow-up) were cases attempted in the TRC for which the respondent-provided address was slightly different than the sampled address, or the respondent refused to provide the household's physical address so the address could not be confirmed. If the address-telephone match was verified, the case was finalized as complete, i.e., as a telephone respondent. If the case was verified as a mismatch, the survey information in the CATI (computer-assisted telephone interviewing) system was cleaned out because it was collected with the wrong household. The field interviewer returned to the household to gain cooperation when the CATI was ready to accept information on the case that was sampled for the study. Six potential mismatch cases were verified as address-telephone number mismatches and of those six, two were completed when a field interviewer returned to the household.

Nonresponse cases include the following:

- **Language problem cases** (48 cases) are those cases sent to the field that were coded in the TRC as households in which a language other than English or Spanish appeared to be spoken, or cases that were coded as hearing or speech problems.

- **Maximum call cases** (477 cases) are those cases that reached the maximum call limit in the TRC. The cases in the maximum call group may have had one language problem or up to two nonhostile refusals in its history but finalized as a maximum call case (i.e., up to 20 calls had been made without completing a Screener).

- **Noncontact cases** (310 cases) are those that resulted in no human contact and no answering machine or only answering machine contact but no human contact.

- **Nonhostile refusal cases** (693 cases) are those that refused three times on the telephone, or were in refusal status when the TRC data collection period closed. They were sent to the field as nonhostile refusals; refusal cases were sent additional mailings and an additional $2 in incentive cash.

[25] For these cases, the data collected in the TRC was cleaned out of CATI prior to sending the case to the field.

RDD duplicate cases were those cases for which telephone numbers sampled for the main RDD study and resulting in completed Screeners were duplicates of telephone numbers matched to sampled addresses for the Bias Study. These cases were sent to the field to confirm that the telephone number was matched to the correct address. One of the 2 cases was confirmed to have been completed with the correct address; the other was found to have been completed with a household whose address did not match the one sampled for the Bias Study and was re-fielded.

All Bias Study cases were sent a letter on U.S. Department of Education stationery explaining the purpose of the study and its sponsor prior to in-person data collection efforts. Cases that were first called by a TRC interviewer before being sent to the field were sent the letter and a $2 incentive (previously described in section 4.1.1) when telephone data collection began. Cases that were not matched to a telephone number were sent a similar letter on March 13, just prior to the beginning of in-person field efforts. Letters sent to non-matched cases did not contain a cash incentive because field interviewers would be arriving at those addresses with a $20 incentive to complete the Screener (the standard incentive offered by the in-person interviewers, as discussed in section 4.2).

4.1.4 Recruitment and Training of Bias Study Field Interviewers

Recruitment of supervisors for the NHES:2007 Bias Study began in November 2006. Five supervisors, previously employed by Westat as field supervisors in different regions of the U.S., were recruited to hire and supervise field interviewers in their respectively assigned PSUs. Regions were roughly assigned to supervisors by each supervisor's home location. In January 2007, supervisors began recruiting field interviewers for their assigned regions. Supervisors were instructed to hire two interviewers per PSU who were experienced in field interviewing methods. All field interviewers were recruited from lists of previously employed field interviewers or through connections to the supervisor.

In-person training was held in Rockville, Maryland, on March 15, 2007, for supervisors and on March 16 and 17, 2007 for field interviewers. Five interviewers were trained later at various times over the course of the Bias Study data collection period because they were unable to attend training on the training dates or were hired after the field training. In total, 66 interviewers were trained, 10 of whom were bilingual in English and Spanish and 12 of whom were travelers who were willing to conduct interviews in other regions. As with TRC interviewers, supervisors and field interviewers were required to sign a notarized Affidavit of Nondisclosure and a Westat confidentiality pledge to adhere to the

confidentiality procedures outlined in the Field Worker Guide (exhibits 4-2 and 4-3), as well as undergo a U.S. Department of Education security background check.

Supervisor training. Prior to training, several conference calls with all of the supervisors were scheduled in which field interviewer recruitment progress and in-person study procedures were discussed with the project director and field manager. In addition, before the in-person training mentioned above, supervisors were mailed a supervisors' manual, a field interviewers' manual, and supplemental printed materials to help them understand NHES, the purpose of the Bias Study, and their role as supervisors. Supervisors' training consisted of a half day of informal lecture and a half day of training on the Basic Field Operating System (BFOS) used for managing cases.

Field interviewer training. Field interviewers were mailed a field interviewer manual, along with other printed home-study materials and exercises to be completed prior to training. Twelve hours of classroom training for field interviewers consisted of lectures, cell-phone training, and hands-on role-plays and practices. At the conclusion of training all field interviewers had to successfully complete a certification exercise before they could begin field work.

Exhibit 4-2. NCES Affidavit of Nondisclosure: NHES:2007 Bias Study

_____ _____
(Job Title) (Date of Assignment to NCES Project)

_____ _____
(Organizations, State or local agency or instrumentality) (NCES Data Base or File Containing Individually Identifiable Information)

_____
(Address)

I, _____, do solemnly swear (or affirm) that when given access to the subject NCES data base or file, I will not

(i) use or reveal any individually identifiable information furnished, acquired, retrieved or assembled by me or others, under the provisions of Section 406 of the General Education Provisions Act (20 U.S.C. 1221e-1) for any purpose other than statistical purposes specified in the NCES survey, project or contract;

(ii) make any disclosure or publication whereby a sample unit or survey respondent could be identified or the date furnished by or related to any particular person under this section can be identified; or

(iii) permit anyone other than the individuals authorized by the Commissioner of the National Center for Education Statistics to examine the individual reports.

_____
(Signature)

(The penalty for unlawful disclosure is a fine of not more than $250,000 (under 18 U.S.C. 3559 and 3571) or imprisonment for not more than 5 years, or both. The word "swear" should be stricken out wherever it appears when a person elects to affirm the affidavit rather than to swear to it.)

State of Maryland
County of _____

Sworn and subscribed to me before a Notary Public in and for the aforementioned County and State this _____ day of _____ (year).

_____
(Notary Public)

Exhibit 4-3. Westat Confidentiality Pledge: NHES:2007 Bias Study

WESTAT

EMPLOYEE OR CONTRACTOR'S ASSURANCE OF CONFIDENTIALITY OF SURVEY DATA

Statement of Policy

Westat is firmly committed to the principle that the confidentiality of individual data obtained through Westat surveys must be protected. This principle holds whether or not any specific guarantee of confidentiality was given at time of interview (or self-response), or whether or not there are specific contractual obligations to the client. When guarantees have been given or contractual obligations regarding confidentiality have been entered into, they may impose additional requirements which are to be adhered to strictly.

Procedures for Maintaining Confidentiality

1. All Westat employees and field workers shall sign this assurance of confidentiality. This assurance may be superseded by another assurance for a particular project.
2. Field workers shall keep completely confidential the names of respondents, all information or opinions collected in the course of interviews, and any information about respondents learned incidentally during field work. Field workers shall exercise reasonable caution to prevent access by others to survey data in their possession.
3. Unless specifically instructed otherwise for a particular project, an employee or field worker, upon encountering a respondent or information pertaining to a respondent that s/he knows personally, shall immediately terminate the activity and contact her/his supervisor for instructions.
4. Survey data containing personal identifiers in Westat offices shall be kept in a locked container or a locked room when not being used each working day in routine survey activities. Reasonable caution shall be exercised in limiting access to survey data to only those persons who are working on the specific project and who have been instructed in the applicable confidentiality requirements for that project.
   Where survey data have been determined to be particularly sensitive by the Corporate Officer in charge of the project or the President of Westat, such survey data shall be kept in locked containers or in a locked room except when actually being used and attended by a staff member who has signed this pledge.
5. Ordinarily, serial numbers shall be assigned to respondents prior to creating a machine-processible record and identifiers such as name, address, and Social Security number shall not, ordinarily, be a part of the machine record. When identifiers are part of the machine data record, Westat's Manager of Data Processing shall be responsible for determining adequate confidentiality measures in consultation with the project director. When a separate file is set up containing identifiers or linkage information which could be used to identify data records, this separate file shall be kept locked up when not actually being used each day in routine survey activities.
6. When records with identifiers are to be transmitted to another party, such as for keypunching or key taping, the other party shall be informed of these procedures and shall sign an Assurance of Confidentiality form.
7. Each project director shall be responsible for ensuring that all personnel and contractors involved in handling survey data on a project are instructed in these procedures throughout the period of survey performance. When there are specific contractual obligations to the client regarding confidentiality, the project director shall develop additional procedures to comply with these obligations and shall instruct field staff, clerical staff, consultants, and any other persons who work on the project in these additional procedures. At the end of the period of survey performance, the project director shall arrange for proper storage or disposition of survey data including any particular contractual requirements for storage or disposition. When required to turn over survey data to our clients, we must provide proper safeguards to ensure confidentiality up to the time of delivery.
8. Project directors shall ensure that survey practices adhere to the provisions of the U.S. Privacy Act of 1974 with regard to surveys of individuals for the Federal Government. Project directors must ensure that procedures are established in each survey to inform each respondent of the authority for the survey, the purpose and use of the survey, the voluntary nature of the survey (where applicable) and the effects on the respondents, if any, of not responding.

PLEDGE

I hereby certify that I have carefully read and will cooperate fully with the above procedures. I will keep completely confidential all information arising from surveys concerning individual respondents to which I gain access. I will not discuss, disclose, disseminate, or provide access to survey data and identifiers except as authorized by Westat. In addition, I will comply with any additional procedures established by Westat for a particular contract. I will devote my best efforts to ensure that there is compliance with the required procedures by personnel whom I supervise. I understand that violation of this pledge is sufficient grounds for disciplinary action, including dismissal. I also understand that violation of the privacy rights of individuals through such unauthorized discussion, disclosure, dissemination, or access may make me subject to criminal or civil penalties. I give my personal pledge that I shall abide by this assurance of confidentiality.

_____

Signature

4.2 Bias Study In-Person Data Collection Procedures

In-person data collection began on March 19, 2007 and ended on June 24, 2007. Cases were distributed to field interviewers in three releases via signature-required FedEx. The first release of cases (3,601 cases in total; 2,067 of which were nonmatch cases) was shipped to field interviewers such that the cases would arrive at their home address on March 19. A large portion of these cases were nonmatch cases because many of the cases that were matched to a telephone number had yet to go through the full telephone-interviewing protocol in the TRC. The second release of cases was shipped to field interviewers around April 10, 2007 and contained 567 cases. The third release of cases was shipped around May 9, 2007 and contained 954 cases. All cases in the second and third releases were cases that had been attempted in the TRC.

In addition to some basic office supplies, interviewers received four main tools for conducting the in-person follow-up. These tools included the Household Folder (HHF) (appendix B), the Household Information Sheet (HIS), a cellular telephone, and an NHES photo ID badge (the HHF and HIS form are described briefly below). Before approaching a sampled residence, field interviewers' first task was to note observations about the neighborhood and the sampled address using an Interviewer Observation Form (IOF) (appendix C). The IOF was intended to capture observations on a number of factors including urbanicity, neighboring area land use (e.g., residential, commercial, or industrial), neighborhood and household affluence, indicators of neighborhood safety or household security, indicators of children in the area, and language diversity.

Once the IOF was completed, the interviewer's job was to verify that the address was a dwelling unit (defined in exhibit 4-9), verify the address label on the HHF (and telephone number if there was one) with a resident of the household, and attempt to gain cooperation, i.e., complete an interview. In order to facilitate this effort, the field interviewers offered a cash incentive of $20 for completing the Screener interview. Upon gaining cooperation, field interviewers would connect the respondent with the TRC on either a Westat-provided cellular telephone or on a household telephone via a toll-free number to complete the survey. The TRC interviewer would proceed with an expanded Screener. The expanded Screener contained additional questions about the household and its members and was only administered to cases sent for in-person follow-up.[26] If the respondent who was selected for an extended interview had a household telephone and it was used to call into the TRC, the extended interview could be continued on

[26] The additional questions in the expanded Screener were repeated in the extended interview for sampled Screener respondents. Data from the additional questions in the expanded Screener were collected for possible analytic use in cases in which the extended interview was not completed. The question wording was similar to the corresponding question in the extended interview.

the household telephone and the field interviewer could leave once the Screener was completed. If the respondent was selected for an extended interview and did not have a household telephone or did not want to use the household telephone, the extended interview continued on the Westat cellular telephone. However, not all extended interviews in the household could be completed immediately after the Screener. In these instances, the interviewer either made arrangements with the TRC to call the respondent back at a specified time, or the field interviewer returned to the household at an agreed upon date and time to complete the interview.

In addition to the study telephone, HHF, HIS, and badge, field interviewers were provided with supplemental materials to handle a variety of nonresponse and other situations. These materials included the following:

- "Sorry I missed you" cards indicating a call attempt (i.e., a visit to the household in the context of the in-person follow-up) when household members were not at home (appendix D);
- appointment cards to write an appointment time, the field interviewer's name, and the study cellular telephone number at which the interviewer could be reached for the respondent (appendix E);
- study brochures;
- copies of the advance letter and copies of community letters to be shown to community officials, such as local police departments and home owner's associations, to establish legitimacy;
- a Spanish translation card for English-speaking field interviewers to gain cooperation with a Spanish-speaking respondent; and
- Spanish versions of many of the materials for Spanish-speaking respondents.

If, upon locating a dwelling unit, the interviewer learned that there were no residents home or the only person home was under 18 years of age, the interviewer was instructed to either leave a "Sorry I Missed You" card in a discreet location or with a youth, or to ask the youth for a time when an adult would be available and leave an appointment card with an approximate time when the interviewer would return.

In-person calls by field interviewers followed a similar time slice procedure as those telephone calls placed when cases were being attempted in the TRC. That is, contact attempts varied by day and by time to maximize the possibility of finding a respondent at home, including weekday

evenings, weekday daytimes, and weekends. Field interviewers made up to 10 follow-up attempts at each address in their assignment with the caveat that they would not revisit a household that refused in person without first consulting their supervisor. In order to efficiently work cases, interviewers were instructed to plan their household visits such that they could make calls on several cases in the same or close-by segments on the same trip, prioritizing appointments first, followed by new cases, and then all other cases.

At a designated time each week, the field interviewer would hold a reporting call with a field supervisor. Each case the field interviewer attempted that week was reviewed with the field supervisor, and the field supervisor would determine if the case was to be reattempted, reassigned, or given a final disposition code (i.e., closed out, with no further attempts). The field supervisors then entered all contact attempts and results into BFOS. The NHES field manager in the Rockville office monitored the BFOS and held a weekly individual meeting with each supervisor to discuss any problems or field interviewer needs. A weekly conference call that included all field supervisors, the project director, and the field manager was held at the end of each week during data collection and for several weeks after data collection ended to discuss overall progress, any changes in protocol, new cases being sent to the field, and any outstanding problems.

4.2.1 Key Data Collection Tools

Field interviewers were supplied with a number of tools to help them gain cooperation during in-person efforts and to collect important observational information about each case. The key tools included the Interviewer Observation Form (IOF) (discussed at the beginning of section 4.2), the Household Folder (HHF), the Household Information Sheet (HIS), and the Field Non-Interview Report (NIR). The HHF, HIS, and NIR are briefly discussed below.

Household Folder. Each HHF indicated the sampled address, the telephone number (if one had been matched to the sampled address), and a script that the field interviewer was to follow upon making contact with a household member (appendix B). Interviewers were instructed to locate the address, indicate the time and date of the visit, type of dwelling unit (e.g., stand alone home, townhouse or rowhouse, apartment, etc.), and briefly discuss the outcome of the visit, any problems encountered, or important observations on the back of the HHF.

Household Information Sheet. A Household Information Sheet (HIS)/TRC Non-Interview Report Form (NIRF) was enclosed with each HHF if the sampled address had been matched to a telephone number (exhibit 4-4). This form was one or two pages in length and indicated the sampled address, telephone number, and a summary of contact attempts made by the TRC indicating the date, time, day of the week, time slice (morning, daytime, or evening), and result of the call. This form also contained the comments from the TRC NIRFs (exhibit 4-5).

Exhibit 4-4. Household Information Sheet (HIS): NHES:2007 Bias Study

ID: F000001

National Household Education Survey: 2007 FOLLOW-UP
Household Information Sheet

Loaded Address and Phone:
1234 LUCKY RD
FREDERICK, MD 21704
(301) 555 - 4231

Result: RB

Contact History

DATE	TIME	DAY	RESULTS
02/16/2007	2:14 P	FRI	D 1 1
02/23/2007	8:18 P	FRI	E 5 5
02/25/2007	2:26 P	SUN	W 3 3
02/25/2007	2:41 P	SUN	W 3 3
02/25/2007	2:56 P	SUN	W 42 42
03/01/2007	2:29 P	THU	D 2 2
03/13/2007	2:07 P	TUE	D 2 RB

Exhibit 4-5. Telephone Center Non-Interview Report Form (NIRF): NHES:2007 Bias Study

(301) 555 - 4231 DATE OF NIRF: 03/01/07 TIME OF NIRF: 14:29:37

REASONS REFUSED SCREENER NIRF

FR SAYS --SORRY WE'RE NOT ANSWERING ANY Q--AN
D IMMEDIATELY HUNG UP BEFORE I COULD SAY ANYT
HING

REFUSED BY A FEMALE MILD-NO HOSTILITY

---

(301) 555 - 4231 DATE OF NIRF: 03/13/07 TIME OF NIRF: 14:07:48

REASONS REFUSED SCREENER NIRF

FR SAID SOMETHING ABT SOMEONE NOT BEING THERE
NOW THEN HUNG UPclick

REFUSED BY A FEMALE MILD-NO HOSTILITY

A **Field Non-Interview Report Form** (NIRF) was filled out for each household where an interview was not completed (appendix F). Information collected on the NIRF included obtained and observable demographics of the would-be respondent/refuser (name, sex, age, race), type of nonresponse (e.g., language, maximum call, refusal, other), and reason for refusal or interview breakoff (i.e., the respondent decides to terminate the interview before completion).

4.2.2 Other Field Procedures

Some of the sampled addresses were apartment buildings, but the vendor-provided address did not indicate an apartment number. In situations like these, if there was a telephone match and the respondent confirmed that address (with the change that there should be an apartment number), then that household (at the address corresponding to the matching telephone number) was retained. Otherwise, field interviewers were instructed to collect specific information about an apartment building in order to randomly sample one or more apartment numbers (depending on the number of addresses originally sampled in the building). Specifically, interviewers counted the number of cases they had at that address, counted the total number of apartments in the building at a sampled address, and noted how the apartments were numbered (e.g., whether apartments were numbered 101-110, 201-210, 301-310; versus A1-A10, B1-B10, C1-C10). Once interviewers compiled this information, the field manager used a

random sampling algorithm to select apartment numbers for the study. Field interviewers returned to the address to gain cooperation from those sampled units.

4.2.3 Final Household Dispositions

Cases could be finalized with one of several different final field disposition codes. These dispositions were used in BFOS to record the status of the field effort (exhibit 4-6). There were some discrepancies between the BFOS status and the CATI status (i.e., the final status captured by the CATI system) of some cases. For example, if a field interviewer left the household before the extended interview was completed, there may have been a breakoff or language problem of which the interviewer was unaware. The BFOS and CATI were reconciled at the end of data collection. Results are reported in table 4-2 using the final disposition codes recorded after this reconciliation was complete. However, composite dispositions that take into account the final TRC disposition (i.e., the CATI status at the end of the TRC-initiated attempts) were derived for use in weighting and computing unit response rates. Also in table 4-2, among cases that were sent to the field for address-phone match verification, only the field effort results of those cases that were found to be mismatched are reported (6 cases out of 23 potential mismatch cases were found to be mismatched; 1 case out of 2 RDD duplicates was found to be a mismatch), since for the remaining cases, the TRC-initiated results were retained.

Completed cases (C1, C2, C3). In-person field efforts resulted in 998 completed Screeners where no one in the household was sampled for an extended interview (C1); 1,106 sampled households had both completed Screeners and extended interviews (C2); and 447 households had a completed Screener but one or more extended interviews were never completed (C3).

Refusal cases (RB). If, during an in-person visit, a household member refused to participate, and the refusal was not hostile and no one in the household had refused before (in-person or by telephone), then a letter on U.S. Department of Education stationery was sent by FedEx to the sampled address further explaining the importance of the study. Field interviewers were instructed to attempt to gain cooperation again about two weeks after the letter had been mailed. In-person refusal letters were sent to 426 households during the in-person data collection. Any refusal that was deemed hostile either in the TRC or in person was coded as a final refusal and a field interviewer did not attempt refusal conversion. In-person refusal cases that had also refused at least once by telephone or had one prior in-person refusal (i.e., a member of the household refused twice to a field interviewer) were closed as final refusals. There were 1,100 final Screener refusals as the result of in-person efforts.

Exhibit 4-6. Final Household Field Disposition Codes: NHES:2007 Bias Study

Final disposition	Code	Explanation
Completed—no extended interviews needed	C1	This code was used when the TRC completed the Screener and no extended interviews were required.
Completed—Screener and one or more extended interviews	C2	This code was used if the respondent completed the Screener and any or all extended interviews were also completed.
Completed Screener—one or more extended interviews outstanding	C3	This code was used if the respondent completed the Screener, and one or more extended interviews remained to be completed in the household.
Refusal/breakoff	RB	This code was used if a household member refused to participate or broke off before completing the Screener with the TRC interviewer.
Maximum call	MC	This code was used if a field interviewer was unable to make a successful contact with the household after making 10 visits, on different days and at different times.
Language	LP	This code was used when no one in the household spoke English or Spanish or there was a speech or hearing problem.
No Entry	NE	This code was used for a locked building or gated community.
Not Found	NF	This code was used when an interviewer could not locate a valid address.
Vacant/Demolished/Condemned	NV	A case was coded as vacant if no one lived in the residence or the residence was demolished or condemned.
Not a Dwelling Unit	ND	This code was used when an address did not fit the definition of a dwelling unit. Businesses were coded "ND".
Other	NO	Any other result not described above, such as a respondent who was too ill to participate.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Table 4-2. Final results of in-person data collection: NHES:2007 Bias Study

Cases sent for in-person data collection	Total number	Results of in-person efforts of Bias Study										
		C1	C2	C3	RB	MC	LP	NE	NF	NV	ND	NO
Total[1]	5,104	997	1,106	447	1,101	635	95	56	14	397	93	163
Nonmatch cases (address not matched to telephone)	2,067	435	471	178	379	245	31	33	9	186	37	63
Mismatched cases												
Incorrect residential telephone number match	108	22	23	6	20	14	1	0	0	11	4	7
Nonworking or nonresidential telephone number	1,394	299	328	126	243	139	17	6	3	153	38	42
Potential address-telephone number mismatch[2]	6	1	0	1	2	1	0	0	0	0	0	1
Nonresponse cases												
Language problem	48	7	4	0	5	2	27	0	0	2	0	1
Maximum call	477	64	100	55	110	94	7	6	1	14	6	20
Noncontact	310	48	70	22	57	64	3	5	0	22	1	18
Nonhostile refusal	693	121	110	59	285	75	9	6	1	9	7	11
RDD duplicate cases[3]	1	0	0	0	0	1	0	0	0	0	0	0

[1] Excludes 18 cases sent to the field for which addresses were verified as being the ones sampled for the Bias Study. These cases were considered to be the TRC completes.

[2] Twenty-three potential address-telephone number mismatch cases were sent to the field for address-telephone number match verification. Six of the cases were found to be address-telephone number mismatches and were attempted by field interviewers and two of those were completed in the field. Only the field result of the six mismatch cases are reported in the table.

[3] Two sampled addresses for these cases were matched to telephone numbers that were identical to telephone numbers sampled for the main RDD NHES:2007 study. They were sent to the field to verify that the address-telephone match was correct. One was found to be an incorrect address-telephone match and is reported in the table.

NOTE: The results of the in-person efforts are coded as follows (see exhibit 4-6 for more detailed descriptions of these codes): C1, C2, C3: Screener completed; RB: Refusal/breakoff; MC: Maximum call; LP: Language, speech, or hearing problem; NE: No entry; NF: Not found; NV: Vacant/ demolished/condemned; ND: Not a dwelling unit; NO: Other.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Maximum call cases (MC). In order to close out a case as a maximum call, field interviewers must have made at least 10 in-person attempts with a minimum of three attempts on weekends, three attempts in the evening (after 6 p.m.) on different days of the week, two attempts in the afternoon on different days of the week, and two attempts in the morning on different days of the week. In the final two weeks of the Bias Study data collection, this maximum call criterion was reduced to five contact attempts, to ensure that efforts were spread across all remaining cases. When a case was classified as a final maximum call case, with a supervisor's approval, the field interviewer left a postcard that contained four questions about the household (exhibit 4-7) and a $5 cash incentive. Out of 635 maximum call Screener cases, postcards were returned for 222 cases, or 35 percent of them.

Exhibit 4-7. Maximum Call Postcard: NHES:2007 Bias Study

NHES
National Household
Education Surveys Program

SORRY WE MISSED YOU!

We had hoped to interview you for the National Household Education Surveys Program, an important research study sponsored by the National Center for Education Statistics of the U.S. Department of Education. The study is completed and we will not attempt to reach you again. However, for statistical purposes, will you please take a minute to complete this postcard? We know that your time is valuable, and as a token of our appreciation we are enclosing $5.

After responding to the questions, please use the attached sticker to seal it with the mailing address on the outside, and then mail it back to us. If you have any questions about the survey, please feel free to contact Westat, the social science research firm conducting the survey at 1-888-696-5672.

Please answer the following questions by placing a check mark (√) in the appropriate box. Your answers are confidential and the information will be used for statistical purposes only.

How many people currently live in this household?

- ☐ One
- ☐ Two or three
- ☐ Four or more

How many children (under 18 years old) currently live in this household?

- ☐ None
- ☐ One
- ☐ Two or three
- ☐ Four or more

Is your home:

- ☐ Owned (with a mortgage, or paid in full)?
- ☐ Rented?
- ☐ Other arrangement?

What is the highest level of education completed by anyone in your household?

- ☐ Bachelor's degree or higher
- ☐ High school diploma
- ☐ Less than a high school diploma

Thank you very much for your time.

<Print Field ID at bottom>

Language problem cases (LP). The NHES interviews could be conducted in English or Spanish, and bilingual TRC interviewers were available to conduct the interview in either language. Field interviewers were instructed that, if they were not bilingual and they encountered a non-English, Spanish-speaking household, they could attempt to gain cooperation using a translation card (exhibit 4-8) to introduce the purpose of their visit and connect to a bilingual TRC interviewer. If they were unable to gain cooperation using the translation card, interviewers then attempted to verify the address and telephone information and then notify their supervisor so that the case could be reassigned to a bilingual field interviewer. If the language spoken in the household was something other than English or Spanish, the case was closed out as a "Language Problem." Ninety-five Screener cases were finalized as language problems due to speech or hearing difficulties or because the language spoken in the household was something other than English or Spanish.

Exhibit 4-8. Translation card text: NHES:2007 Bias Study

English text:

I work for Westat, a social science research company in Maryland. I am working on the National Household Education Surveys Program, which is a research study sponsored by the U.S. Department of Education. Are you a member of this household and at least 18 years old? I only speak English, but we are conducting interviews by telephone and have Spanish-speaking interviewers who can explain the study to you. Using my cell phone, will you allow me to call our telephone research center so that you can speak with someone who speaks Spanish? We're offering $20 to households that complete the initial screening interview. Thank you.

Spanish text:

Trabajo para Westat, una firma localizada en el estado de Maryland que hace investigación en el área de las ciencias sociales. Trabajo para el Programa Nacional de Encuestas en Hogares sobre Educación, el cual es un estudio patrocinado por el Departamento de Educación de los Estados Unidos. ¿Es usted miembro de este hogar y tiene por lo menos 18 años de edad? Yo hablo solamente inglés, pero estamos realizando entrevistas por teléfono y tenemos entrevistadores que hablan español; ellos le pueden explicar de qué se trata el estudio. ¿Me permite usar mi celular para llamar a nuestro centro de investigación para que usted pueda hablar con alguien que habla español? Estamos ofreciendo $20 a los hogares que completan la entrevista inicial. Muchas gracias.

No Entry (NE). Some interviewers encountered apartment buildings that were security-locked or communities that were gated. Most security-locked buildings contained entryways with intercom systems. Field interviewers were instructed to use the intercom system to explain the reason for the visit if they could not gain entry. For both gated communities and locked buildings, if the interviewer could not gain access after several tries, or if there was no intercom system, they were instructed to present the Community Authorization letter (appendix A) to the manager of the building or the security company used to monitor the community to help explain the importance of NHES. In 56 cases, field interviewers were never able to gain entry to the building or the community to complete a Screener.

Not Found (NF). In 14 cases field interviewers could not locate an address. The code of not found was only used after attempting to find the address using three different resources. Additional resources included internet search engines, local post offices, the local fire or police departments, real estate agencies, and citizens in the area.

Vacant, demolished, or condemned (NV). A dwelling unit was coded as vacant, demolished, or condemned if upon the field interviewer's first visit the residence was vacant, demolished, or condemned. If, during their initial contact with a household, the field interviewer made contact with a household member and verified the address, and later returned to conduct the Screener and found that the household was vacant, demolished, or condemned, the case was given a final code of "NO" for other nonresponse, and notes about the case were made on the HHF. A total of 397 sent to the field were finalized as vacant, demolished, or condemned.

Not a dwelling unit (ND). Field interviewers were expected to identify whether or not an address was a dwelling unit (DU) and the type of DU. In most cases, field interviewers did not have difficulty determining whether an address was a DU. Generally, Bias Study addresses were associated with a detached house, an apartment, or one house in a row of houses, such as a townhome or half of a duplex. Structures that did not qualify as DUs were institutional group quarters, such as a halfway house or other institution with 10 or more unrelated residents, military barracks and BOQs (Bachelor Officer's Quarters), dormitories, penal institutions (e.g., jails, prisons), hospitals, homes for the aged, nursing homes, and businesses.

Exhibit 4-9 gives the definition of a DU used for purposes of this study. A total of 93 addresses did not fit the study definition of a DU.

Exhibit 4-9. Dwelling unit defined: NHES:2007 Bias Study

A **dwelling unit** is a house, an apartment, a mobile home or trailer, a group of rooms or a single room occupied as separate living quarters or, if vacant, intended for occupancy as separate living quarters.

Separate living quarters are those in which the occupants live and eat separately from any other individuals in the building and have direct access from the outside of the building or through a common hall.

Field interviewers also indicated the type of DU structure located at the address (exhibit 4-10). There were 3,043 field cases that were coded as stand-alone homes; 512 were coded as town homes or duplexes; 1,230 were coded as apartments; and 176 were coded as something other than stand-alone home, town home or duplex, or apartment. The remaining cases were missing a code for DU type.

Exhibit 4-10. Dwelling unit structure type: NHES:2007 Bias Study

DU STRUCTURE TYPE

SA	Stand-alone home
TH	Town home or Duplex
AP	Apartment, Flat
OS	Other, Specify

Other (NO). The code "NO," or other nonresponse, was used when all other final result codes did not apply. For example, when all household respondents were unavailable during the entire field period because of vacation or because the residence was used as a seasonal home, this code would be used. Other examples of when this code was used are when the only adult respondent was too ill to participate or when the address was initially confirmed by a resident but upon an interviewer's second visit the residence was vacant. One hundred and sixty-three cases were coded "other" nonresponse.

4.2.4 Known Problems

In designing the Bias Study, Westat used past field studies as a guide for anticipating possible problems that could occur and for developing procedures and approaches to address these potential problems. This approach proved successful in heading off operational problems in most instances. For example, Westat developed, from experience in previous field tests, a method for sampling apartment numbers in instances when a sampled address should, but did not, have an apartment number provided by the vendor (apartment sampling procedures are described in section 4.2.2). Most of the problems encountered during the 2007 Bias Study were related to the fact that the Bias Study was a much larger, national sample compared to samples used in previous tests of in-person follow-up, and the previous field tests required fewer field interviewers and only one supervisor. Because the Bias Study was conducted on a larger scale, it presented a challenge in staffing the TRC to meet the needs of the field at any given time. Prior to in-person data collection, procedures were developed to coordinate field interviewer and telephone interviewer schedules, such as field interviewers supplying a weekly projection of days and times they would work and real-time text messaging to inform the TRC of actively working field interviewers. Despite these efforts, coordinating schedules was difficult on a large scale because issues such as weather could affect field operations.

Other issues that were not apparent in previous field tests were the potential difficulties of tracking extended interview progress in the field. As a result of the experience in the NHES:2007 Field Test, additional field codes were developed before data collection for the Bias Study to keep field supervisors informed of outstanding extended interviews. However, the BFOS for the 2007 Bias Study was not developed to maintain details about the specific extended interview(s) outstanding or the respondent(s) sampled for the interview(s). This kind of information is important if a field interviewer is expected to return to a household to secure cooperation from a specific respondent. While procedures were implemented during data collection to meet interviewer needs in order to secure cooperation in the Bias Study, the process of tracking this type of information would be more efficiently and seamlessly gathered if collected using BFOS.

Communication to and with field interviewers was also more difficult in a large study. In previous field tests, when there were fewer field interviewers and only one field supervisor, communication of procedural changes or respondent refusals to the TRC was more direct. Relaying information in real-time was much easier because there were fewer supervisors and interviewers to

inform. The use of laptops by field interviewers and regular checking of project email would increase the efficiency of communication in future studies.

Other issues arose during the Bias Study data collection that were not related to the relative scale of the study in relation to past field studies. One was the relative ease for falsifying maximum call postcards. One way to reduce the potential for falsification of maximum call postcards is to develop a minimum percentage of maximum call postcards selected for validation for each field interviewer. Although a small number of falsified maximum call postcards were detected, these were removed from processing and new maximum call postcards were sent to the affected addresses. Thus, information from these falsified maximum call postcards has no effect on the analysis given in this report.

4.3 Final Sample Yield

The total numbers of completed cases by data collection stage for the RDD sample and the Bias Study sample are provided in table 4-3. The counts for the Bias Study reflect both the initial telephone data collection efforts and the in-person data collection efforts. There were a total of 54,034 Screeners completed for the RDD survey, and 4,894 Screeners completed for the Bias Study.

Table 4-3. Number of completed cases by data collection stage: NHES:2007 RDD sample; NHES:2007 Bias Study sample

Data collection stage	RDD sample	Bias Study sample
Screener	54,034	4,894
Extended interview		
School Readiness (SR)	2,633	292
Parent and Family Involvement in Education (PFI)	10,681	1,123
Adult Education for Work-Related Reasons (AEWR)	7,710	1,065

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

4.4 Characterization of Bias Study Cases

As described above, for cases in the Bias Study sample with a matching telephone number, a TRC interviewer first attempted to gain cooperation (i.e., to complete an interview) by phone before sending cases to the field. Of the 7,500 sampled cases for the Bias Study, 2,396 were finalized (i.e.,

received a final disposition code) in the TRC. These include the 2,378 cases with telephone numbers that were not sent for in-person efforts (2,235 completes, 42 hostile refusals, 9 other nonresponse, 92 potential mismatch cases), plus the 17 potential mismatches and 1 RDD duplicate that were confirmed in the field to have been completed with the correct household over the phone. The remaining 5,104 cases were finalized in the field. The distribution of cases into these two groups is summarized in table 4-4.

Table 4-4. Distribution of Bias Study cases: NHES:2007 Bias Study

Subgroup	Sample size	Percent of total
Total Bias Study sample	7,500	100.0
Finalized in Telephone Research Center	2,396	31.9
Completes	2,235	29.8
Hostile refusals	42	0.6
Other nonresponse	9	0.1
Potential mismatches[1]	109	1.5
RDD duplicate	1	#
Finalized in field[2]	5,104	68.1
No matching telephone number	2,067	27.6
Mismatched telephone number[3]	1,509	20.1
Telephone nonresponse cases	1,528	20.4

Rounds to zero.
[1] Includes 92 potential mismatches not sent to the field and 17 sent to the field and confirmed to have been completed with the correct household.
[2] Finalized in field means the case received a final disposition code in the field, where the disposition codes are indicated in exhibit 4-6. Finalized cases include completes as well as nonresponding and ineligible cases.
[3] Includes 1,394 cases with nonworking or nonresidential telephone numbers, 108 cases with an incorrect telephone number match, 6 potential mismatches determined to have been completed with the wrong household over the phone, and 1 RDD duplicate determined to have been completed with the wrong Bias Study case.
NOTE: Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

In order to assess the quality of the addresses obtained for the Bias Study sample, an address disposition (separate from the Screener dispositions previously discussed) was coded for each case that was sent to the field. Table 4-5 gives distributions of address dispositions for the Bias Study cases that were finalized in the field. Of the cases finalized in the field, 97 percent had a correct address (or correct with a minor change). This percentage was approximately equal for cases previously attempted in the TRC (the *telephone nonrespondent* columns of table 4-4) and those that were not (the *nonmatch or mismatch* columns of table 4-4). Therefore, most of the addresses from the address lists appeared to be valid.

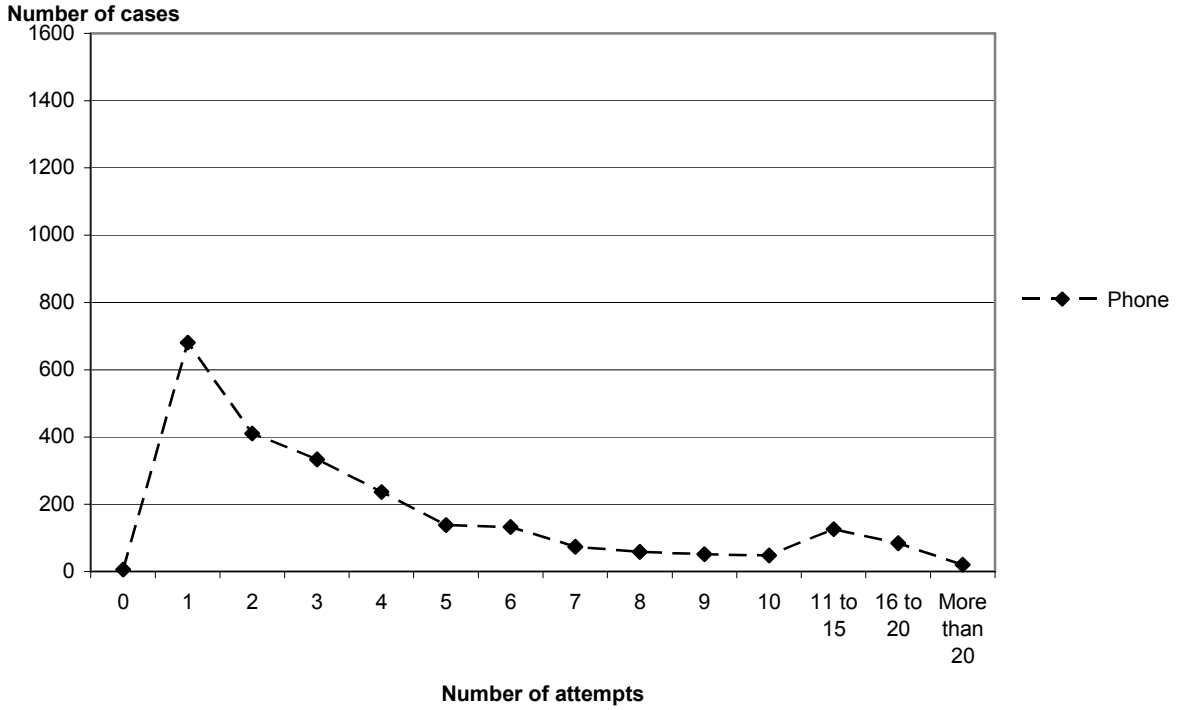
Table 4-5. Distributions of address dispositions for Bias Study cases finalized in the field: NHES:2007 Bias Study

Address disposition	Total finalized in field		Nonmatch or mismatch		Telephone nonrespondent	
	Sample size	Percent	Sample size	Percent	Sample size	Percent
Total	5,104	100.0	3,576	100.0	1,528	100.0
Correct address or correct with minor change	4,950	97.0	3,470	97.0	1,480	96.9
No entry	56	1.1	39	1.1	17	1.1
Address not found	14	0.3	12	0.3	2	0.1
Unable to confirm address[1]	65	1.3	42	1.2	23	1.5
Other[2]	19	0.4	13	0.4	6	0.4

[1] Includes field nonresponse cases for which the addresses were not clearly displayed or confirmed from other sources.
[2] Examples include addresses believed to be outside of the sampled county and gutted apartment buildings.
NOTE: Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

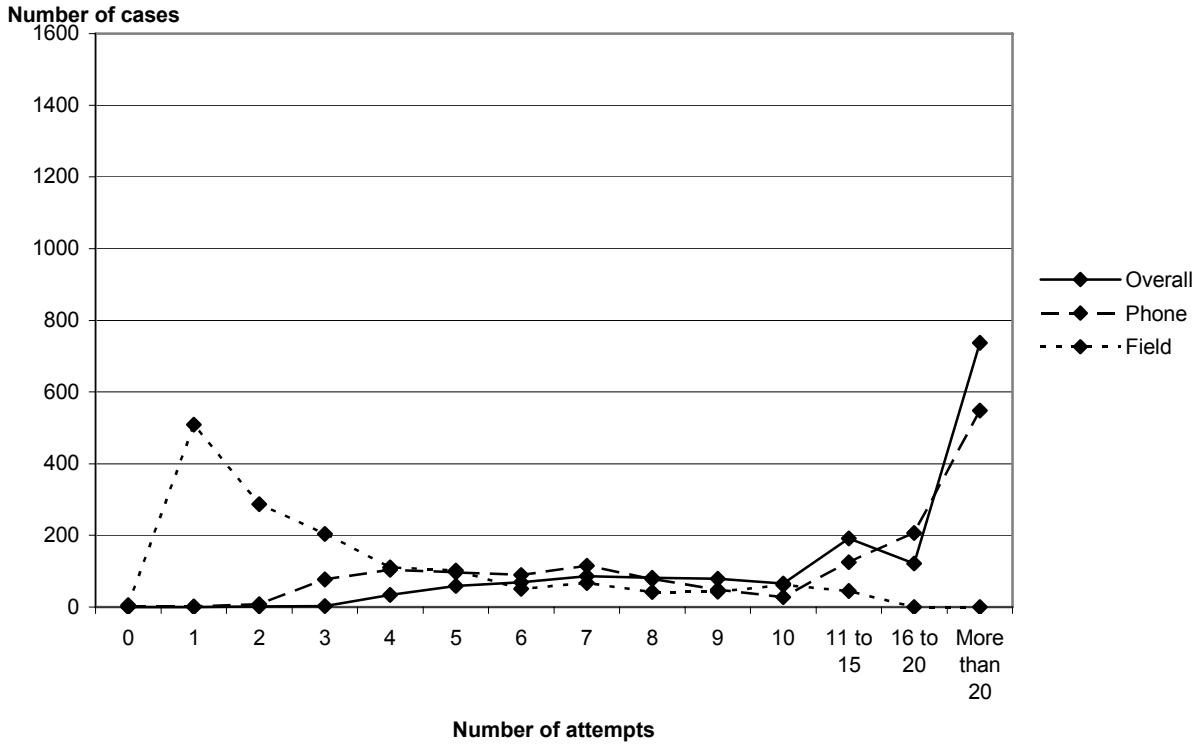
An analysis of the number of attempts required to finalize a case (i.e., to assign the case a final disposition code) may be used to assess and understand the amount of effort expended. The number of attempts to finalize a Screener is shown in figures 4-1 through 4-3 for cases finalized in the TRC, telephone nonresponse cases, and cases with no matching telephone number or a mismatched telephone number, respectively. As evident in figure 4-1, Screener completes (i.e., successfully completed Screener cases) were finalized quickly by phone. Also, figure 4-3 shows that more than 2,700 of the 3,576 nonmatch/ mismatch cases received one or fewer phone attempts for the Screener. This indicates that instances of mismatched phone numbers were often identified on the first phone attempt, where they were determined to be a mismatch either because the phone number was nonworking or nonresidential or the address provided by the respondent in the telephone interview did not match the sampled address. For telephone nonresponse cases (figure 4-2), a large number of attempts were made in the TRC before sending the cases to the field.

Figure 4-1. Total number of attempts to finalize a Screener for cases finalized in the TRC: NHES:2007 Bias Study



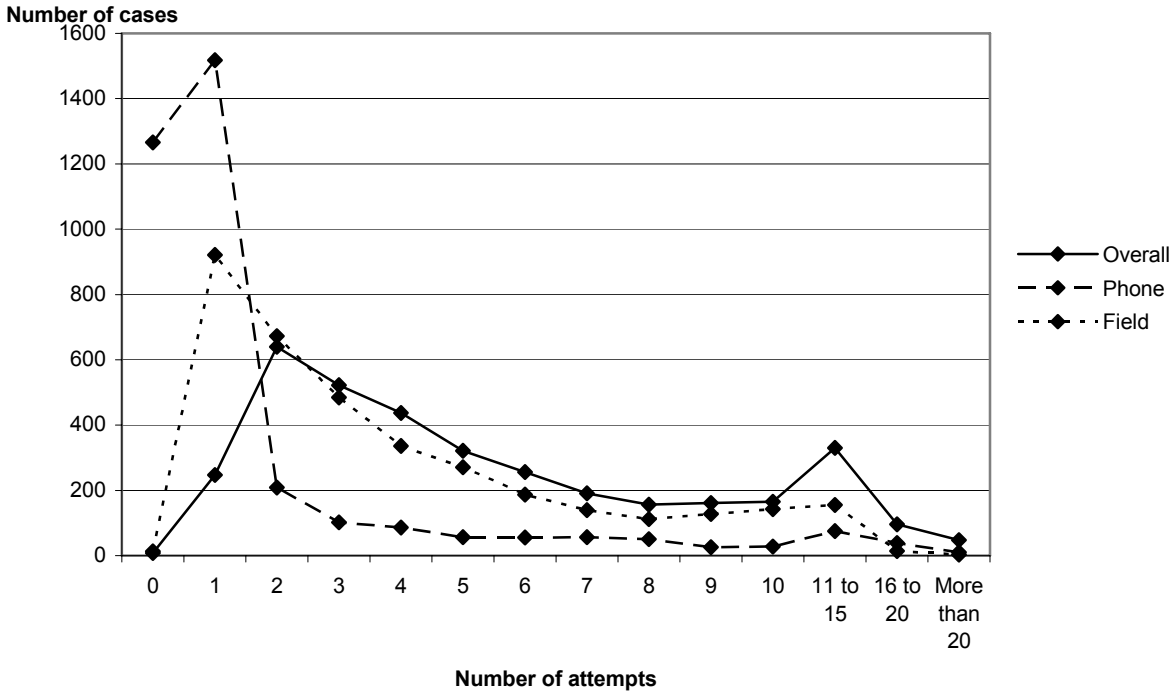
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Figure 4-2. Total number of attempts to finalize a Screener for telephone nonresponse cases: NHES:2007 Bias Study



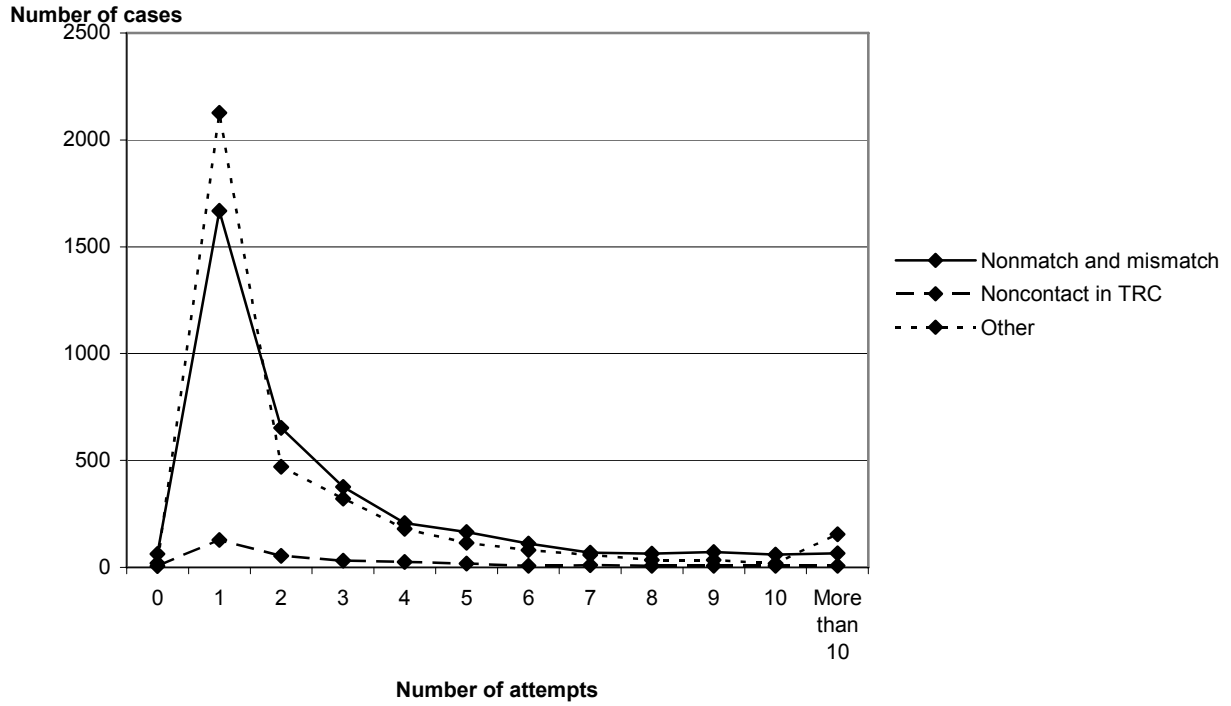
NOTE: Overall number of attempts is the sum of the number of phone attempts to finalize a Screener and the number of field attempts to finalize a Screener for a given case.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Figure 4-3. Total number of attempts to finalize a Screener for nonmatch and mismatch cases: NHES:2007 Bias Study



NOTE: Overall number of attempts is the sum of the number of phone attempts to finalize a Screener and the number of field attempts to finalize a Screener for a given case.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Figure 4-4. Number of attempts to ascertain residential status of household: NHES:2007 Bias Study



NOTE: The "Other" category consists of cases for which the residency status was determined in the initial TRC effort, i.e. cases that were finalized in the initial TRC effort and cases that were sent to the field after having been coded a language problem, maximum call, or refusal in the TRC.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

It took an average of 3.8 attempts to finalize a Screener as complete, nonresponse, or nonresidential in the field. As shown in table 4-6, this varied by the final household field disposition, with nonrespondents requiring almost twice as many attempts as completes, and over twice as many attempts as cases finalizing as nonresidential. Having not been previously attempted by phone, cases with no matching phone number required a greater number of attempts in the field to finalize as complete or nonresponse than the telephone nonresponse cases (e.g., language problem, maximum call, noncontact, and refusal). No such pattern is evident for final nonresidential dispositions. In general, households that had refused the Screener in the TRC required fewer attempts overall to obtain a final disposition code than the other TRC results.

Table 4-6. Percentage of cases finalized in field and mean number of field attempts, by final household field disposition and TRC result: NHES:2007 Bias Study

TRC result	Total finalized in field	Percentage of cases finalized in field			Mean number of field attempts			
		Completes	Nonrespondents	Nonresidential	Total	Completes	Nonrespondents	Nonresidential
Total	5,104	50.0	40.2	9.9	3.8	2.9	5.3	2.4
No matching telephone number	2,067	52.4	36.3	11.2	4.1	3.2	6.0	2.5
Mismatched telephone number[1]	1,509	53.5	32.7	13.9	3.7	2.9	5.5	2.3
Language problem	48	22.9	72.9	4.2	3.1	3.0	3.1	3.0
Maximum call	477	45.9	49.7	4.4	3.9	2.7	5.2	1.6
Noncontact	310	45.2	47.4	7.4	4.0	2.6	5.6	3.0
Refusal	693	41.7	55.8	2.5	2.9	2.2	3.5	1.5

[1] Excludes the 17 potential mismatches and 1 RDD duplicate that were verified as having been completed with the correct household in the TRC.

NOTE: The percentage of cases finalized in the field by final household disposition may not sum to 100 because of rounding. The final household field dispositions correspond to the codes in exhibit 4-6 as follows: Completes: C1, C2, and C3; Nonrespondents: RB, MC, LP, NE, and NO; Nonresidential: NF, NV, and ND.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Residency status (i.e., whether the address is residential or nonresidential) was generally determined on the first attempt. The number of attempts to ascertain residency status is shown in figure 4-4. The number of attempts is plotted separately for cases with no matching telephone number or a mismatched telephone number, cases coded as non-contact in the TRC before being sent to the field, and all other Bias Study cases.[27] For nonmatch or mismatch cases and cases coded non-contact in the TRC, the number of attempts reflects the field effort only, since residency status was never determined by phone.

The number of refusals for cases finalized in the TRC, telephone nonresponse cases, and cases with no matching telephone number or a mismatched telephone number, respectively, is shown in table 4-7. Most of the refusals were by phone. Overall refusal for telephone nonresponse cases and nonmatch and mismatch cases is the sum of the number of refusals by telephone and the number of refusals in field before a give case was finalized in field. For example, if a case ever refused to finalize a Screener once by telephone and once in field, it was counted as a case with 2 refusals in table 4-7.

Characteristics of the three sets of Bias Study cases that completed an extended interview—cases finalized in the TRC, telephone nonresponse cases, and nonmatches and mismatches—are provided in tables 4-8 to 4-10 for SR respondents, PFI respondents, and AEWR respondents, respectively. The frequencies are unweighted and are intended only as a description of the sample. A limited comparison of the three sets of cases is provided below as a first look at potentially noteworthy differences. However, the purpose of the frequencies is not to provide an evaluation of bias. Weighted frequencies for the evaluation of bias are provided in chapters 7 and 8. The percentages reflect skip patterns; the denominators include only respondents to the item.

[27] All other Bias Study cases consist of cases for which the residency status was determined in the initial TRC effort (i.e., cases that were finalized in the initial TRC effort and cases that were sent to the field after having been coded a language problem, maximum call, or refusal in the TRC).

Table 4-7. Number and percentage of cases, by number of refusals and subgroups: NHES:2007 Bias Study

	Cases finalized in the Telephone Research Center		Telephone nonresponse cases						Nonmatch and mismatch cases					
	Refusals by telephone		Overall refusals		Refusals by telephone[1]		Refusals in field		Overall refusals		Refusals by telephone[1]		Refusals in field	
Cases classified by number of refusals	Sample size	Percent	Sample size	Percent	Sample size	Percent	Sample size	Percent	Sample size	Percent	Sample size	Percent	Sample size	Percent
Total	2,396	†	1,528	†	1,528	†	1,528	†	3,576	†	3,576	†	3,576	†
Cases with 0 refusal	1,438	60.0	398	26.0	503	32.9	1,023	67.0	2,633	73.6	3,387	94.7	2,759	77.2
Cases with 1 refusal	633	26.4	211	13.8	175	11.5	444	29.1	593	16.6	134	3.7	553	15.5
Cases with 2 or more refusals	325	13.6	919	60.1	850	55.6	61	4.0	350	9.8	55	1.5	264	7.4

† Not applicable.
[1] Primarily refusals obtained in the initial TRC data collection effort, but also includes refusals over the telephone during the in-person effort.
NOTE: Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Table 4-8. Characteristics of Bias Study School Readiness (SR) respondents: NHES:2007 Bias Study

Characteristic	Finalized in Telephone Research Center		Telephone nonrespondents		Nonmatches and mismatches	
	Sample size	Estimate	Sample size	Estimate	Sample size	Estimate
Total	103	100.0	47	100.0	142	100.0
Participation in center-based care	66	64.1	34	72.3	77	54.2
Recognizes all colors	86	83.5	42	89.4	121	85.2
Counts to 20 or higher	69	67.0	33	70.2	96	67.6
Knows all letters	39	37.9	15	31.9	39	27.5
Can write own name	67	65.0	35	74.5	91	64.1
Census region						
Northeast	31	30.1	15	31.9	16	11.3
Midwest	31	30.1	6	12.8	36	25.4
South	28	27.2	12	25.5	50	35.2
West	13	12.6	14	29.8	40	28.2
Home ownership						
Own	84	81.6	36	76.6	81	57.0
Rent/other	19	18.4	11	23.4	61	43.0
Age						
3–4	85	82.5	41	87.2	118	83.1
5–6	18	17.5	6	12.8	24	16.9
Grade						
Not enrolled	36	35.0	14	29.8	62	43.7
Preschool	67	65.0	33	70.2	80	56.3

NOTE: Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Table 4-9. Characteristics of Bias Study Parent and Family Involvement in Education (PFI) respondents: NHES:2007 Bias Study

Characteristic	Finalized in Telephone Research Center		Telephone nonrespondents		Nonmatches and mismatches	
	Sample size	Estimate	Sample size	Estimate	Sample size	Estimate
Total	498	100.0	164	100.0	461	100.0
Parents participate in 5 or more activities in the child's school[1]	249	51.1	88	54.3	229	50.4
Parents report school provides information very well						
About how child is doing in school	299	61.4	100	61.7	269	59.3
About how to help child with his/her homework	224	46.0	76	46.9	225	49.6
About why child is placed in particular groups or classes	210	43.1	77	47.5	209	46.0
About how to help child plan for college or vocational school	116	41.0	32	36.0	89	37.6
About the family's expected role at child's school	239	49.1	79	48.8	221	48.7
Parents took 3 or more outings with child in the past month[2]	254	51.0	87	53.0	218	47.3
Parents check to see that child's homework gets done	365	79.0	137	90.1	383	90.8
Census region						
Northeast	110	22.1	50	30.5	86	18.7
Midwest	146	29.3	29	17.7	95	20.6
South	132	26.5	54	32.9	157	34.1
West	110	22.1	31	18.9	123	26.7
Home ownership						
Own	431	86.5	129	78.7	277	60.1
Rent/other	67	13.5	35	21.3	184	39.9

See notes at end of table.

Table 4-9. Characteristics of Bias Study Parent and Family Involvement in Education (PFI) respondents: NHES:2007 Bias Study—Continued

Characteristic	Finalized in Telephone Research Center		Telephone nonrespondents		Nonmatches and mismatches	
	Sample size	Estimate	Sample size	Estimate	Sample size	Estimate
Age						
3–6	62	12.4	21	12.8	67	14.5
7–8	65	13.1	25	15.2	84	18.2
9–10	69	13.9	27	16.5	61	13.2
11–12	73	14.7	20	12.2	64	13.9
13–14	70	14.1	23	14.0	63	13.7
15–16	93	18.7	30	18.3	83	18.0
17–20	66	13.3	18	11.0	39	8.5
Grade						
Kindergarten	40	8.0	15	9.1	36	7.8
1–2	56	11.2	23	14.0	82	17.8
3–4	80	16.1	23	14.0	77	16.7
5–6	72	14.5	23	14.0	59	12.8
7–8	74	14.9	26	15.9	74	16.1
9–10	80	16.1	26	15.9	73	15.8
11–12	96	19.3	28	17.1	60	13.0

[1] Any five or more of the following: Attended a general school meeting (FSMTNG); attended a meeting of the parent-teacher organization or association (FSPTMTNG); went to a regularly scheduled parent-teacher conference with the child's teacher (FSATCNFN); attended a school or class event, such as a play, dance, sports event, or science fair because of the child (FSSPORT); served as a volunteer in the child's classroom or elsewhere in the school (FSVOL); participated in fundraising for the school (FSFUNDRS); served on a school committee (FSCOMMTE); and met with a guidance counselor in person (FSCOUNSLR).

[2] Any three or more of the following: Visited a library (FOLIBRAY); visited a bookstore (FOBOOKST); went to a play, concert, or other live show (FOCONCRT); visited an art gallery, museum, or historical site (FOMUSEUM); visited a zoo or aquarium (FOZOO); attended an event sponsored by a community, religious, or ethnic group (FOGROUP); and attended an athletic or sporting event (outside of school) in which the child was not a player (FOSPRTEV).

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Table 4-10. Characteristics of Bias Study Adult Education for Work-Related Reasons (AEWR) respondents: NHES:2007 Bias Study

Characteristic	Finalized in Telephone Research Center		Telephone nonrespondents		Nonmatches and mismatches	
	Sample size	Estimate	Sample size	Estimate	Sample size	Estimate
Total	530	100.0	134	100.0	401	100.0
Participation in adult education for work-related reasons	221	41.7	62	46.3	212	52.9
Participation in distance education	130	57.0	34	53.1	121	54.5
Sex						
Male	203	38.3	43	32.1	185	46.1
Female	327	61.7	91	67.9	216	53.9
Adult education participation status from screener						
Participant	268	50.6	72	53.7	225	56.1
Nonparticipant	262	49.4	62	46.3	176	43.9
AEWR respondent was Screener respondent						
Yes	169	31.9	34	25.4	104	25.9
No	361	68.1	100	74.6	297	74.1
Census region						
Northeast	143	27.0	26	19.4	90	22.4
Midwest	132	24.9	28	20.9	75	18.7
South	129	24.3	54	40.3	131	32.7
West	126	23.8	26	19.4	105	26.2
Home ownership						
Own	467	88.1	101	75.4	226	56.4
Rent/other	63	11.9	33	24.6	175	43.6

NOTE: Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

The three Bias Study groups are similar on certain key characteristics, such as whether the SR-eligible child can count to 20 or higher, whether the parents participate in 5 or more activities at the PFI-eligible child's school, and the participation in distance education for adults. For example, 67 percent of SR respondents who finalized in the TRC indicated that their children were able to count to 20 or higher, compared to 70 percent for the telephone nonrespondents and 68 percent for the nonmatches and mismatches.

However, there are some differences between the groups. For instance, the rate of home ownership is lower for cases that had no matching phone number or a mismatched phone number. For PFI respondents, the home ownership rate was 60 percent for cases with nonmatches and mismatches, compared to 87 percent for cases finalized in the TRC, and 79 percent for telephone nonrespondents.

This page is intentionally blank.

5. UNIT AND ITEM RESPONSE RATES

Unit and item nonresponse are generally regarded as important measures of survey quality. Response rates are of concern because survey estimates could potentially suffer from nonresponse bias if those who respond to a survey or item are very different from those who do not. This chapter presents the unit and item response rates for the 2007 National Household Education Surveys Program (NHES:2007) Bias Study. Unit response rates are defined (section 5.1) and an analysis of unit response rates is presented for the Screener (section 5.2). Unit response rates are also given for each of the three extended interview surveys, the School Readiness Survey (SR), the Parent and Family Involvement in Education Survey (PFI), and the Adult Education for Work-Related Reasons Survey (AEWR) (section 5.3). Item response rates are discussed in section 5.4.

5.1 Definition of Unit Response Rates

A unit response rate is the ratio of the number of units with completed interviews (for example, the units could be telephone numbers, households, or persons) to the number of units sampled and eligible for the interview. In some cases, these rates are easily defined and computed, while in other cases the denominator of the ratio must be estimated.

For reporting the results from the Bias Study, the *overall unit response rate* indicates the percentage of possible interviews that were completed taking all survey stages into account, while the *unit response rate* measures the percentage of interviews that were completed for a specific stage of the survey. Specifically, household members were identified for interviews in a two-stage process, with a Screener interview conducted before an extended interview. Screener interviews were conducted to enumerate and sample household members, and then questionnaires were administered for the sampled members. If the responding household member failed to complete the first-stage Screener, no members could be sampled for other interviews. Under this design, the unit response rate for the first stage is the estimated percentage of households that completed the Screener. The unit response rate for the second stage (SR, PFI, or AEWR interviews) is the percentage of sampled persons that completed these extended interviews. The overall unit response rate is the product of the first- and second-stage unit response rates (i.e., the Screener unit response rate multiplied by the extended interview unit response rate).

Unit response rates and overall unit response rates can be either unweighted or weighted. The unweighted rate, computed using the raw number of cases, provides a useful measure of the success of the operational aspects of the survey. That is, the unweighted rate indicates the proportion of residential cases attempted that were successfully completed. The weighted rate, computed by summing the base weights (usually the reciprocals of the probability of selecting the units) for both the numerator and denominator, gives a better measure of the success of the survey with respect to the population sampled since the weights allow for inference of the sample data (including response status) to the population level. When analyzing survey data, estimates are typically computed using adjusted survey weights. (See chapter 6 for a discussion of the computation of the adjusted survey weights for the Bias Study.) However, weighted unit response rates, which include sums of weights of both unit respondents and unit nonrespondents, are computed using base weights. The unweighted and weighted unit response rates are usually similar unless the probabilities of selection and the unit response rates in the categories with different selection probabilities vary considerably. All of the unit response rates discussed in this chapter are base weighted unless noted specifically in the text, since the main purpose of this chapter is to describe the success of the survey with respect to the survey population.

5.2 Screener Unit Response Rates

The unit response rates use the weighted number of responding households as the numerator, and the total number of households as the denominator. For the RDD sample, the number of households needs to be estimated because the residential status of all the telephone numbers is not known. Various approaches are available; the vendor-assisted method was used for the NHES:2007 RDD sample (Hagedorn et al. 2008). Estimating the denominator is not an issue for the Bias Study because the residential status of each sampled address is known.

Two sets of unit response rates were computed for the Bias Study: the reduced treatment response rates and the full treatment response rates. In the reduced treatment, the Telephone Research Center (TRC) status is treated as the final household status for Bias Study cases attempted in the TRC, and the field status is treated as the final household status for nonmatch and mismatch cases. In the full treatment, the final household status is based on efforts in both the TRC and in the field for cases attempted in the TRC, and the field status is the final household status for nonmatch and mismatch cases. For example, a case that was a final refusal in the TRC but responded to the Screener in the field is treated as a nonrespondent in the reduced treatment but as a respondent in the full treatment. Exhibit 5-1 shows how cases were classified for the reduced and full treatments. Table 5-1 shows the disposition of the

7,500 Bias Study cases under both the reduced treatment and the full treatment. After the full treatment, 92 percent of the Bias Study cases were identified as residential. A total of 4,894 cases were respondents with the full treatment, and 4,235 were respondents under the reduced treatment. Table 5-2 gives the weighted and unweighted Screener unit response rates for the Bias Study and, by way of comparison, for the RDD sample. The Screener unit response rates for the RDD sample, the Bias Study full treatment, and the Bias Study reduced treatment are 52.8 percent, 67.7 percent, and 59.8 percent, respectively. Because the RDD sample is restricted to households with telephones whereas the Bias Study sample involves both telephone and nontelephone households whose addresses appear on the U.S. Postal Service residential delivery file, the comparable groups between the two samples are the RDD mailable cases and the Bias Study address-telephone matched cases. The Screener unit response rate for the Bias Study address-telephone matched cases is 59.9 percent, compared to 54.4 percent for the RDD mailable sample.

Exhibit 5-1. Screener response status classification for the NHES:2007 Bias Study sample

Attempted in TRC[1]	Screener completed in TRC	Found to be nonresidential in field	Screener completed in field	Screener response status[2]: Reduced treatment	Screener response status[2]: Full treatment	Number of cases
Yes	Yes	†	†	R	R	2,235
Yes	No	Yes	†	NR	I	63
Yes	No	No	Yes	NR	R	659
Yes	No	No	No	NR	NR	857
No	†	Yes	†	I	I	441
No	†	No	Yes[3]	R	R	2,000
No	†	No	No	NR	NR	1,245

† Not applicable.
[1] Cases not attempted in the TRC are those with no matching telephone number or a mismatched telephone number.
[2] R: respondent; NR: nonrespondent; I: ineligible.
[3] Includes the 109 potential mismatches and 1 RDD duplicate case.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Table 5-1. Number of Screener cases attempted, by residential and response status, and weighted percentages of cases: NHES:2007 Bias Study

Screener response category	Reduced treatment		Full treatment	
	Number (unweighted)	Percent (weighted)	Number (unweighted)	Percent (weighted)
Total	7,500	100.0	7,500	100.0
Residential	7,059	93.0	6,996	92.3
Responded	4,235	55.6	4,894	62.5
Did not respond	2,824	37.4	2,102	29.8
Nonresidential	441	7.0	504	7.7

NOTE: The numbers of cases are unweighted counts; the percentages are weighted. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Table 5-2. Weighted and unweighted Screener unit response rates for the RDD sample, the RDD mailable cases only, the Bias Study sample, and the Bias Study address-telephone matched only: NHES:2007 RDD and NHES:2007 Bias Study

	Overall unit response rates	
	Weighted (percent)	Unweighted (percent)
RDD sample	52.8	53.2
RDD mailable[1]	54.4	55.0
Bias Study sample, reduced treatment	59.8	60.5
Bias Study sample, reduced treatment, address-telephone matched only	59.9	60.3
Bias Study sample, full treatment	67.7	70.0

[1] The unweighted rate was computed using the Wave 1 sample only, and assuming 37.6 percent of telephone numbers with an unknown residency status (*no answer* and *no answer, answering machine* cases) are residential. See section 4.2.1 of Hagedorn et al. (2008) for details.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program, 2007.

Table 5-3 shows the numbers of screened households in which household members were sampled for extended interviews by the sample to which the cases belonged and the extended interviews completed. In the Bias Study sample with full treatment, about 59 percent of households had at least one household member sampled for an extended interview. The distribution of sampled extended interviews in the households under reduced treatment is comparable to the full treatment distribution. The RDD sample distribution of sampled extended interviews differs from the Bias Study distribution because for

the RDD sample the sampling of adults for AEWR interviews was done only in the Wave 1 sample (a random subsample comprising approximately 54 percent of the full RDD sample).[28,29]

Profile of Screener Unit Response Rates

In most RDD surveys, it is difficult to obtain and examine the characteristics of households that do not respond to the screening interview. Consequently, the ability to examine nonresponse bias at this stage of the survey is limited. In table 5-4, the Screener unit response rates are given by characteristics of the geographic area of the households[30] based on the 2000 Census, and by whether an answering machine message was left during the study. These characteristics were considered because they are available for all cases and have the potential to be associated with response propensity.

Table 5-3. Number and percent of households responding to the Screener, by sample type and type of extended interviews scheduled: NHES:2007 RDD and NHES:2007 Bias Study

	RDD sample		Bias Study reduced treatment		Bias Study full treatment	
Type of interview scheduled	Number of households	Percent of households	Number of households	Percent of households	Number of households	Percent of households
Total	54,034	100.0	4,235	100.0	4,894	100.0
At least one extended interview	24,725	45.8	2,452	57.9	2,882	58.9
School Readiness (SR) interview only	1,305	2.4	118	2.8	133	2.7
Parent and Family Involvement in Education (PFI) interview only	9,846	18.2	782	18.5	936	19.1
SR and PFI interview	1,988	3.7	165	3.9	204	4.2
Adult Education for Work-Related Reasons (AEWR) interview only	9,157	16.9	1,081	25.5	1,245	25.4
PFI and AEWR interviews	2,016	3.7	248	5.9	290	5.9
SR and AEWR interviews	242	0.4	37	0.9	45	0.9
SR, PFI, and AEWR interviews	171	0.3	21	0.5	29	0.6
No extended interview	29,309	54.2	1,783	42.1	2,012	41.1

NOTE: Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program, 2007.

[28] The subsampling into waves was done to allow for more efficient and effective use of follow-up procedures in a study with a short data collection period such as NHES. Cases in the Wave 1 sample were followed up more intensively than the remainder of the sample. See Hagedorn et al. (2008) for further details.
[29] The sampling of adults for AEWR interviews was discontinued after Wave 1 due to low response rates.
[30] For the RDD sample, these are characteristics of the ZIP code that has the most households associated with telephone numbers in the exchange; for the Bias Study sample, these are characteristics of the predominant ZIP code in the block.

The response rate patterns by area characteristic for the Bias Study (both the full treatment and the reduced treatment) were compared to those observed in the RDD study. The one characteristic, shown in table 5-4, that stands out is the indicator of whether an answering machine message was left. In the RDD sample and in the Bias Study reduced treatment, the Screener response rate was higher among households in which no answering machine message was left. In the Bias Study full treatment, the rate was higher among households in which at least one answering machine message was left. Among Bias Study cases (with the full treatment), the Screener unit response rate varied by region of the country, with the highest unit response rate in the Midwest and the lowest unit response rate in the West. Areas with higher proportions of Whites generally had higher unit response rates than those with lower proportions of Whites, and correspondingly, areas with lower proportions of Hispanics, Blacks, and Asians had higher unit response rates than those with higher proportions in these subgroups. Areas with lower median home values generally had higher unit response rates than those with higher median home values. Areas with higher proportions of renters had lower response rates than those with lower proportions of renters. In general, these response rate patterns for the Bias Study (both the full treatment and the reduced treatment) are consistent with those observed in the RDD study.

This univariate profile of Screener unit response rates by the characteristics of the areas is difficult to interpret because there are so many characteristics to consider. In addition, some of these characteristics are correlated, and the univariate profile does not explore these relationships. Consequently, a multivariate analysis, which is discussed in chapter 6, was performed to examine the interrelationship of the characteristics and the Screener unit response rates.

5.3 Extended Interview Unit Response Rates and Overall Unit Response Rates

During the screening interview, all children were enumerated in households with eligible children; adults were enumerated in only a subsample of households. After the enumeration, children or adults within the household were sampled for the SR, PFI, or AEWR surveys. The person who was identified as the most knowledgeable about the sampled child's care and education (nearly always a parent and most often the child's mother) was designated to be the respondent for the SR or PFI interview. The AEWR interview was conducted with the sampled adult.

The number of persons enumerated and sampled, and those with completed interviews for each survey are given in table 5-5; the table includes counts for both the RDD sample and the Bias Study

(full treatment) sample. Table 5-6 gives the unit response rates and overall unit response rates for the RDD sample and the Bias Study (full treatment) sample. For the SR survey, the unit response rate is 79.8 percent for the Bias Study sample, compared to 77.0 percent for the RDD sample; for the PFI survey the unit response rates are 75.9 percent for the Bias Study sample and 74.1 percent for the RDD sample; for the AEWR survey, the unit response rates are 60.6 percent and 62.4 percent for the Bias Study and RDD samples, respectively.

Table 5-4. Weighted Screener unit response rates for the NHES:2007 RDD sample, reduced treatment NHES:2007 Bias Study sample, and full treatment NHES:2007 Bias Study sample, by selected characteristics

Characteristic	RDD sample	Bias Study sample, reduced treatment	Bias Study sample, full treatment
Total	52.8	59.8	67.7
Mailable status			
Mailable address	54.4	59.8	67.7
No mailable address	43.3	†	†
Answering machine message indicator			
No message left	65.7	64.0	67.0
One or more messages left	42.3	48.7	69.4
Percent White			
Less than 30 percent	43.4	46.1	51.5
30 to 39 percent	46.1	55.2	62.4
40 to 59 percent	47.8	57.3	64.5
60 to 69 percent	49.7	56.6	63.3
70 to 79 percent	52.8	63.4	71.6
80 to 89 percent	53.6	61.3	69.2
90 percent or more	58.0	63.1	71.9
Percent Black			
0 to 49 percent	53.0	60.0	67.9
50 percent or more	48.3	51.5	60.3
Percent Asian			
Less than 10 percent	54.7	61.9	70.1
10 to 19 percent	47.6	53.0	59.0
20 to 29 percent	44.4	44.8	52.6
30 percent or more	39.2	49.1	55.7
Percent Hispanic			
0 to 39 percent	53.4	60.8	68.9
40 percent or more	44.7	49.2	54.6

See notes at end of table.

Table 5-4. Weighted Screener unit response rates for the NHES:2007 RDD sample, reduced treatment NHES:2007 Bias Study sample, and full treatment NHES:2007 Bias Study sample, by selected characteristics—Continued

Characteristic	RDD sample	Bias Study sample, reduced treatment	Bias Study sample, full treatment
Median home value			
1st decile	57.6	66.7	74.2
2nd through 4th deciles	57.0	64.1	72.2
5th through 6th deciles	54.3	60.0	68.8
7th through 9th deciles	49.3	55.3	62.7
10th decile	44.2	53.0	60.1
Percent renters			
0 to 49 percent	53.8	61.0	69.1
50 percent or more	42.3	51.1	57.0
Percent college graduates			
Less than 20 percent	54.2	62.9	70.7
20 to 29 percent	54.0	59.0	66.4
30 percent or more	51.3	58.2	66.4
Household income decile			
Less than 40 percent	54.3	61.4	69.0
40 to 59 percent	53.6	61.4	69.7
60 percent or more	54.5	57.4	65.3
Census region			
Northeast	49.9	58.1	67.1
Midwest	59.3	66.7	74.2
South	52.6	58.9	67.1
West	49.2	57.2	63.9
Census division			
New England	51.9	57.6	66.7
Middle Atlantic	49.1	58.5	67.4
East North Central	57.3	68.2	76.6
West North Central	64.0	63.8	69.5
South Atlantic	51.6	55.9	63.9
East South Central	56.7	70.7	82.2
West South Central	52.3	57.0	63.0
Mountain	55.8	70.1	79.8
Pacific	46.5	52.8	58.5

† Not applicable.
NOTE: The categories of each characteristic are based on a multivariate analysis for the nonresponse weighting adjustment, in which the sample was divided into subgroups with the most differential response rates.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program, 2007.

Table 5-5. Number of enumerated children and adults, by type of extended interview and final extended interview status: NHES:2007 RDD sample; NHES:2007 Bias Study sample, full treatment

Type of interview	RDD sample	Bias Study sample, full treatment
School Readiness (SR) interview		
Enumerated	4,030	450
Sampled	3,706	411
Ineligible	239	39
Did not respond	735	75
Total complete	2,633	299
Parent and Family Involvement in Education (PFI) interview		
Enumerated	23,882	2,480
Sampled	14,021	1,459
Ineligible	92	6
Did not respond	3,347	335
Total complete	10,681	1,115
Adult Education for Work-Related Reasons (AEWR) interview		
Enumerated	31,314	4,276
Sampled	11,586	1,609
Ineligible	236	40
Did not respond	3,640	504
Complete	7,710	1,065

NOTE: Counts given in this table are based on classifications according to how the person was sampled. For example, if a child was sampled for the SR interview but was found to be eligible for the PFI interview instead, that child is included in the SR interview counts in this table.
SOURCE: U.S. Department of Education, National Center for Education Statistics, School Readiness (SR) Survey of the National Household Education Surveys Program, 2007; Parent and Family Involvement in Education (PFI) Survey of the National Household Education Surveys Program, 2007; and Adult Education for Work-Related Reasons (AEWR) Survey of the National Household Education Surveys Program, 2007.

Table 5-6. Weighted unit response rates and overall unit response rates, by type of extended interview: NHES:2007 RDD sample; NHES:2007 Bias Study sample, full treatment

	RDD sample		Bias Study sample, full treatment	
Type of interview	Unit response rate	Overall unit response rate	Unit response rate	Overall unit response rate
SR interview	77.0	40.7	79.8	54.0
PFI interview	74.1	39.1	75.9	51.4
AEWR interview	62.4	33.0	60.6	41.0

NOTE: The overall unit response rate is the product of these unit response rates for the surveys and the Screener unit response rates of 52.8 percent for the RDD sample and 67.7 percent for the full treatment Bias Study sample.
SOURCE: U.S. Department of Education, National Center for Education Statistics, School Readiness (SR) Survey of the National Household Education Surveys Program, 2007; Parent and Family Involvement in Education (PFI) Survey of the National Household Education Surveys Program, 2007; and Adult Education for Work-Related Reasons (AEWR) Survey of the National Household Education Surveys Program, 2007.

5.4 Item Response Rates

In the SR, PFI, and AEWR Surveys of NHES:2007, as in most surveys, the responses to some data items are not obtained for all interviews. There are numerous reasons for item nonresponse. Some respondents do not know the answer for the item or do not wish to respond for other reasons. Some item nonresponse arises when an interview is interrupted and not continued later, leaving items at the end of the interview blank. Item nonresponse may also be encountered when responses provided by the respondent are not internally consistent, and this inconsistency is not discovered until after the interview is completed. In these cases, the items that were not internally consistent were set to missing and then imputed.

For items on the SR, PFI, and AEWR[31] surveys, the median item response rates for the Bias Study were 99.3 percent, 99.4 percent, and 99.8 percent, respectively. These rates are comparable to the corresponding item response rates for the RDD sample (99.3 percent, 99.0 percent, and 99.7 percent, respectively).

As in the main NHES: 2007 study, most items on the SR, PFI, and AEWR surveys had item response rates over 90 percent. For the SR survey, there were two items for which the response rate was substantially[32] lower in the Bias Study than for the RDD sample (SEDOWELL, the number of times since the beginning of the school year that the child's teacher/school has contacted the household about anything the child is doing particularly well or better in preschool, and SEENJOY, the extent to which the child enjoys school) and two items in the PFI survey (SEBEHAV, the number of times since the beginning of the school year that the child's teacher/school has contacted the household about any behavior problems the child is having in school, and SESCHOL, whether the family applied for a scholarship or grant for the child). There is no reason to believe that SEDOWELL, SEENJOY, SEBEHAV, and SESCHOL are sensitive items that would be subject to lower response rates with the in-person effort than with strictly telephone collection. Thus, there is no indication of systematic differences between the two samples in the willingness or ability of respondents to respond to items. In summary, the item response rates for the NHES:2007 surveys, from both the RDD sample and the Bias Study sample, are high and consistent across samples.

[31] For the AEWR survey, the median item response rates given correspond to the set of items that were imputed. For this survey, because no public-use data file was produced, only a subset of items needed for the analysis were imputed.

[32] In this context, "substantially" is defined as a difference of 5.0 percent or more between the RDD item response rate and the Bias Study item response rate, for items that were applicable to more than 20 cases in each of the samples.

For analysis purposes, numeric and categorical data items with missing data were imputed. The imputations were done because complete responses were needed for the variables used in developing the sampling weights and for the variables needed for this analysis; additionally, for the RDD sample, the items were fully imputed in order to provide data users with data files containing complete cases.

A hot-deck procedure was used to impute most missing responses. In this approach, the entire file was sorted into cells defined by characteristics of households or respondents that are likely to be associated with differences in item response propensities. These characteristics, or boundary variables, were used to group respondents into those most likely to have the same response or the same response propensity for the data item to be imputed. The hot-deck procedure has been used for imputation in all previous NHES administrations, and the specific procedures used for imputation for the NHES:2007 surveys were based on the procedures used in prior surveys. For details on the hot-deck procedure used for NHES:2007, see Hagedorn et al. (2008).

This page is intentionally blank.

6. WEIGHTING

The objective of the National Household Education Surveys Program (NHES:2007) surveys is to make inferences about the entire civilian, noninstitutionalized population for the domains of interest. Weighting is necessary to account for differential probabilities of selection and to reduce potential bias due to nonresponse and differential coverage of subpopulations. However, weighting is only effective in reducing bias to the extent that the auxiliary variables used in weighting are related to the outcomes of interest. Even after weighting adjustments are made, some bias, if it exists, is likely to remain. The purpose of the bias analysis is to assess the bias in the final weighted estimates from the NHES:2007, to the extent possible.

To accomplish this, three sets of weights were used in the bias analysis. The first set corresponds to the main random digit dialing (RDD) sample and is described in Hagedorn et al. (2008).[33] This set does not contain any of the Bias Study sample. The other two sets were created for the Bias Study analysis. The weights differ in their treatment of Bias Study sample households that were coded as nonrespondents in the Telephone Research Center (TRC) before being sent to the field. As described in chapter 5, the reduced treatment method treats the status in the TRC as final, and the full treatment method assigns the status based on the entire TRC and field effort. For all three sets of weights, the estimates were adjusted to totals of persons living in both telephone and non-telephone households so the estimates represent the same population.

The weighting process for the two sets of Bias Study sample weights are described below.

6.1 Household-Level Weights

The primary purpose of the Screener in NHES:2007 was to provide information required to assess the eligibility of household members for an extended interview. Household-level information that is of analytic interest was also collected during the extended interview. Since no data intended for analyses were collected at the household level only, as with the RDD sample, household-level weights were calculated solely to provide general characteristics of the Bias Study sample and for use as a basis for computing person-level weights for the analysis of the extended interview data.

[33] The weighting procedures used for NHES:2007 are similar to those used in NHES:2005. (See Hagedorn et al. 2006.)

The area sample for the Bias Study was designed to be an equal probability sample of addresses within phone match status.[34] The household-level weight for the Bias Study sample was thus the product of three factors:

- weight associated with the differential sampling of addresses with a telephone number match and those without (A_j);
- adjustment for Screener nonresponse (C_j); and
- poststratification adjustment to align estimates with external population totals (E_j).

The procedures for computing the Bias Study household-level weights follow. The procedure for the full treatment and reduced treatment weights differ only in the assignment of response status in step 2.

1. Addresses with a telephone number match were sampled at twice the rate of addresses without a matching telephone number. Therefore, the household-level base weight, A_j, was set equal to 1 for addresses with a telephone number match and 2 for addresses without a match.

2. The second weighting factor adjusts for households that did not respond to the NHES:2007 Screener. Each household in the NHES Bias Study sample was classified as either a respondent *(R)*, a nonrespondent *(NR),* or an ineligible case *(I)*. The classification differed for the full treatment and reduced treatment methods, as was shown in exhibit 5-1.

   The base weights of the nonrespondent cases were distributed to the base weights of the respondent cases within a nonresponse adjustment cell. A Chi-Square Automatic Interaction Detection (CHAID) analysis was used to identify characteristics most associated with Screener nonresponse. (For a description of the CHAID analysis, refer to section 6.3.) These characteristics, which were primarily geographic characteristics associated with the ZIP code, were used to form the cells for nonresponse adjustment of the household weights. The same set of characteristics was considered for the Bias Study as for the RDD sample. One additional variable, whether the address had a valid matching phone number, was also a potential candidate. This variable was not relevant for the RDD sample, but was shown to be an important predictor of nonresponse in the Bias Study sample. All other variables identified by CHAID as important predictors of Screener nonresponse for the Bias Study sample were also identified as important predictors for the RDD sample.[35]

[34] The PSUs and segments within PSUs were sampled such that all addresses ultimately had the same probability of selection, hence there is no weighting adjustment factor accounting for that level of sample development.

[35] Characteristics used in household nonresponse adjustment for the Bias Study sample included whether the household had a telephone number match, census division, percentage White in the ZIP Code, median home value in the ZIP Code, and whether an answering machine message was ever left.

The same nonresponse adjustment cells were used for both sets of Bias Study weights. Table 6-1 contains the cells used for Screener nonresponse adjustment in the NHES:2007 Bias Study, along with the estimated Screener unit response rate for each cell under both the full treatment and reduced treatment. The nonresponse adjustment factor, $C_{j(c)}$, applied to each responding household *j* in adjustment cell *c* is

$$C_{j(c)} = \frac{\sum_{h \in R_c \cup NR_c} A_h}{\sum_{h \in R_c} A_h},$$

where A_h is the weight for household *h* associated with differential sampling of addresses with a telephone number match and those without, and R_c and NR_c are the sets of respondents and nonrespondents in cell *c*, respectively. Note that these sets of respondents and nonrespondents are defined differently for the full treatment and reduced treatment methods, according to exhibit 5-1.

3. The final step in computing the household weight was to adjust to known national control totals in order to account for household-level over- or under-coverage in the address lists used for sampling and to enable the production of estimates for the RDD sample, full treatment Bias Study sample, and reduced treatment Bias Study sample that represent the same population. Poststratification was used to accomplish this task. Poststratification adjusts survey weights to known population totals. The characteristics used in poststratification were census region and presence of children under 18 years of age. Table 6-2 presents the control totals used for poststratifying the household-level weights. The variables used in poststratification of the household weights were the same for the Bias Study sample as for the RDD sample; for the RDD sample, these variables were chosen to address differences in landline telephone coverage rates with respect to region in which the household is located and presence of children in the household. The control totals for poststratification were obtained from the March 2006 CPS.

   The final household-level weight for household *j*, HHW_j, is given by

$$HHW_j = A_j \cdot C_{j(c)} \cdot E_{j(d)},$$

   where $E_{j(d)}$ is the poststratification adjustment factor described above for adjustment cell *d*, where household *j* has the attributes corresponding to poststratification cell *d*.

Table 6-1. Screener nonresponse adjustment cells: NHES:2007 Bias Study

Cell	Nonmatching or mismatched telephone number	Census division	Percent White	Median home value	Answering machine message left	Full treatment estimated response rate (percent)[1]	Reduced treatment estimated response rate (percent)[2]
1	1	1,5,9	0,1,2,3,4,5,6	†	†	48	48
2	1	1,5,9	7	0,1,2,3,4	†	79	79
3	1	1,5,9	7	5,6,7,8,9	†	59	59
4	1	1,5,9	8,9	0,1,2,3,4,5	†	53	53
5	1	1,5,9	8,9	6,7,8,9	†	54	54
6	1	2,4	†	0	†	79	79
7	1	7	†	0	†	63	63
8	1	2,4,7	†	1	†	51	51
9	1	2,4,7	†	2,3,4	†	68	68
10	1	2,4,7	†	5,6,7,8,9	†	48	48
11	1	3	†	†	†	71	71
12	1	6,8	†	†	†	78	78
13	2	1,2,3,6,8	†	0,1,2,3,4,5	1	81	53
14	2	4,5,7,9	†	0,1,2,3,4,5	1	70	45
15	2	†	†	6,7,8,9	1	66	45
16	2	†	0,1,2	†	2	64	54
17	2	†	3,4,5,6,7	0,1,2	2	83	70
18	2	†	3,4,5,6,7	3,4,5	2	94	76
19	2	†	3,4,5,6,7	6,7,8,9	2	77	65
20	2	†	8,9	†	2	88	78

† Not applicable. In these situations, either no cases in the cell had the condition or the cell consisted of all values of the particular variable.

[1] The estimated response rate is the number of completed interviews divided by the sum of the number of completed interviews and nonresponses, weighted by the probability of selection. Cases found in the field to be nonresidential are considered ineligible and are excluded.

[2] The estimated response rate for cells with a nonmatching or mismatched telephone number is the same as in the full treatment method. For cells with a matching phone number (nonmatching or mismatched telephone number = 2), the estimated response rate is the number of completed interviews in the TRC, divided by the number of cases attempted in the TRC, weighted by the probability of selection.

NOTE: Category codes were as follows: Nonmatching or mismatched telephone number: 1 = no match or incorrect match; 2 = match. Census Division: 0 = Alaska and Hawaii; 1 = New England; 2 = Middle Atlantic; 3 = East North Central; 4 = West North Central; 5 = South Atlantic; 6 = East South Central; 7 = West South Central; 8 = Mountain; 9 = Pacific (excluding Alaska and Hawaii). Percent White: 0 = less than 10 percent, 1 = 10 to 19 percent, 2 = 20 to 29 percent, 3 30 to 39 percent, 4 = 40 to 49 percent, 5 = 50 to 59 percent, 6 = 60 to 69 percent, 7 = 70 to 79 percent, 8 = 80 to 89 percent, 9 = 90 percent or more. Median home value: 0 = below the 10th percentile in sample, 1 = 10th to 19th percentile in sample, 2 = 20th to 29th percentile in sample, 3 = 30th to 39th percentile in sample, 4 = 40th to 49th percentile in sample, 5 = 50th to 59th percentile in sample, 6 = 60th to 69th percentile in sample, 7 = 70th to 79th percentile in sample, 8 = 80th to 89th percentile in sample, 9 = 90th percentile in sample or higher. Answering machine message left: 1 = yes; 2 = no.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Table 6-2. Control totals for poststratifying the NHES:2007 household-level weights: CPS:2006

Census region[1]	Control total[2]
Total	114,510,050
Northeast	
No children under 18 in household	13,993,709
Children under 18 in household	7,137,051
South	
No children under 18 in household	27,173,229
Children under 18 in household	14,638,867
Midwest	
No children under 18 in household	17,390,279
Children under 18 in household	8,981,331
West	
No children under 18 in household	15,731,203
Children under 18 in household	9,464,380

[1] The following states and the District of Columbia are in each census region: Northeast: CT, MA, ME, NH, NJ, NY, PA, RI, VT; South: AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV; Midwest: IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI; West: AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY.
[2] The control totals are numbers of households.
NOTE: Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey (CPS), March 2006.

6.2 Person-Level Weights for the School Readiness (SR), Parent and Family Involvement in Education (PFI), and Adult Education for Work-Related Reasons (AEWR) Interviews

As described in chapter 3, a sampling algorithm was used to limit the number of persons sampled in each household while maintaining the sampling rates required to attain the target sample sizes. The sampling was based on information collected in the Screener interview from the adult household member who responded to the Screener. For the SR and PFI Surveys, the eligibility of the sampled child was later verified or updated when the parent/guardian most knowledgeable about the child responded to the SR or PFI interview, provided that person was not the Screener respondent. For the AEWR Survey, an eligible adult was defined to be a person 16 years of age or older who was not enrolled in grade 12 or below, not institutionalized, and not on active duty in the U.S. Armed Forces. Because sampling eligibility was defined in terms of the data collected in the Screener, the weighting procedures were developed with possible misclassification (i.e., children sampled for the SR survey who were found to be eligible for the PFI survey and vice versa; adults sampled for AEWR as participants who were found to be

nonparticipants and vice versa) taken into account so that the estimates would not incur bias due to misclassification.

The household-level weight was used as the base weight for each of the person-level (e.g., SR, PFI, and AEWR interview) weights. The person-level weight for sampled person k in household j, $PW_{jk,}$ is the product of the household weight, HHW_j, and four weight adjustment factors:

- weight associated with sampling the person's domain in the given household (A_{jk});
- weight associated with sampling the person from among all eligible persons in the given domain in the household (B_{jk});
- weight associated with extended interview (SR, PFI or AEWR) unit nonresponse (C_{jk}); and
- adjustment associated with raking[36] the person-level weights to Census Bureau estimates of the number of persons in the target population (D_{jk}).

The same procedures were used to compute the person-level weight adjustments in the Bias Study sample as in the RDD sample. The weighting steps for the full treatment and reduced treatment methods were also the same, but the input household-level weights and set of sampled persons differed based on the classification of the household in step 2 of the household-level weighting process. The steps for the person-level weights are described below.

1. The first step in developing the person-level weights was to account for the probability of sampling the person's domain in the given household. For both SR and PFI, if there was an eligible child in the household, then one child was selected for the survey. Thus, the factor for sampling in both the SR and PFI domain was always equal to 1.

   Exhibit 6-1 gives the weighting factors, A_{jk}, used to account for the probability of sampling the adult domains for AEWR, based on the household composition. Note that the domain probabilities of selection are given in table 3-1. For example, if there were no eligible children in the household and there were two eligible adults—one adult education participant and one adult education nonparticipant—then the adult education participant was sampled with probability 0.3637 and the adult education nonparticipant was sampled with probability 0.1819. In such an example, if the adult education participant was sampled, then the weighting factor A_{jk} for that adult was 2.7493, which is the reciprocal of the probability of sampling the adult domain. If the adult education nonparticipant was sampled, then the weighting factor A_{jk} was 5.4985.

[36] See step 4 below for a definition and detailed discussion of raking.

Exhibit 6-1. Weighting factors to account for domain sampling for adults: NHES:2007

Number of SR eligible children in household	Number of PFI eligible children in household	Number of adults in household, by adult education participation status		Weighting factor associated with domain sampling	
		Adult education participant	Adult education nonparticipant	Adult education participant	Adult education nonparticipant
0	0	0	1 or more	—	3.6657
0	0	1 or more	0	1.8328	—
0	0	1 or more	1 or more	2.7493	5.4985
0	1 or more	0	1 or more	—	6.8249
0	1 or more	1 or more	0	3.4125	—
0	1 or more	1 or more	1 or more	5.1187	10.2374
1 or more	0	0	1 or more	—	6.8249
1 or more	0	1 or more	0	3.4125	—
1 or more	0	1 or more	1 or more	5.1187	10.2374
1 or more	1 or more	0	1 or more	—	14.6628
1 or more	1 or more	1 or more	0	7.3314	—
1 or more	1 or more	1 or more	1 or more	10.9971	21.9941

— Indicates that factor is not applicable because there are no adults in the given domain in the household.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

2. The second adjustment, which accounted for the probability of sampling person k from among all eligible persons in the given domain in household j, is

$$B_{jk} = N_{jk} ,$$

where N_{jk} is the number of persons in household j in the same sampling domain as person k.

For each sampled person jk, the unadjusted person-level weight, UPW_{jk}, can be written as the product of the household-level weight and the adjustments for within-household sampling. That is, for sampled person jk, the unadjusted person-level weight is

$$UPW_{jk} = HHW_{jk} \cdot A_{jk} \cdot B_{jk} .$$

3. The next step was to adjust for persons (most knowledgeable parents/guardians in the case of the SR and PFI interviews, and the sampled adults themselves in the case of the AEWR interview) who did not respond to the extended interview. Each extended interview case was classified as either a respondent *(R)* or a nonrespondent *(NR),* depending on whether or not the extended interview was completed for the sampled person. The unadjusted person-level weights *(UPW)* of the nonrespondents were distributed to the unadjusted person-level weights of the respondents within a nonresponse adjustment cell. For the SR and PFI Surveys, the nonresponse adjustment cells were created using a home ownership indicator and grade (where enrolled children with no grade equivalent were included in the cell containing the modal grade for their age; that is, they were assigned to the grade in which most children their age

are enrolled). These variables were used because they are available for all sampled children (both respondents and nonrespondents) and are associated with SR/PFI interview response propensity. See table 6-3 for a list of SR/PFI nonresponse adjustment cells. For the RDD sample, Census region and age/grade combinations were used to form the SR/PFI nonresponse adjustment cells.

Table 6-3. School Readiness/Parent and Family Involvement in Education (SR/PFI)-NHES:2007 interview nonresponse adjustment cells: NHES:2007 Bias Study

Explanatory variable (Home ownership/ Grade or equivalent from Screener)	Number of respondents in cell for full treatment	Completion rate for full treatment (percent)	Number of respondents in cell for reduced treatment	Completion rate for reduced treatment (percent)
Own/all grades	1,038	79.4	873	81.0
Rent or other/Unenrolled or preschool through 8th grade	304	74.1	270	75.0
Rent or other/9th through 12th grade	73	57.5	61	56.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, School Readiness (SR) Survey of the National Household Education Surveys Program, 2007.

For the AEWR interview, three variables were used to create the nonresponse adjustment cells. The first was an indicator of whether the sampled adult was the Screener respondent, the second was the adult education participation status of the adult (as reported by the Screener respondent), and the third was the sex of the adult. The variables were the same as with the RDD sample, but some collapsing of categories was necessary because of smaller sample sizes. These variables were used because they are available for all sampled adults (both respondents and nonrespondents) and are associated with AEWR interview response propensity. (See table 6-4 for a list of the AEWR interview nonresponse adjustment cells.) The nonresponse adjustment factor, $C_{jk(c)}$, applied to each respondent *jk* in adjustment cell *c* is

$$C_{jk(c)} = \frac{\sum_{h \in R_c \cup NR_c} UPW_h}{\sum_{h \in R_c} UPW_h},$$

where UPW_h is the unadjusted person-level weight for sampled person *h*. Thus, for each sampled person *jk*, the nonresponse-adjusted person-level weight, NPW_{jk}, can be written as

$$NPW_{jk} = UPW_{jk} \cdot C_{jk(c)}.$$

Extreme weights may occasionally result when households or persons are sampled at very different rates. Additionally, the procedures used for nonresponse adjustment and poststratification may contribute to extreme weights. A few unexpectedly large sampling weights can seriously inflate the variance of the survey estimates. Thus, for

a small number of records, weight trimming procedures may be used to reduce the impact of such large weights on the estimates produced from the sample. Weight trimming refers to the process of artificially adjusting a few extreme weights (those that are unusually large relative to other weights for members of the same subgroup) to reduce their impact on the weighted estimates.

Table 6-4. Adult Education for Work-Related Reasons (AEWR)-NHES:2007 interview nonresponse adjustment cells: NHES:2007 Bias Study

Explanatory variables (Indicator of whether the sampled adult was the Screener respondent/adult education participation status from Screener/sex)	Number of respondents in cell for full treatment	Completion rate for full treatment (percent)	Number of respondents in cell for reduced treatment	Completion rate for reduced treatment (percent)
Screener respondent/adult education participant/male	118	81.7	103	81.5
Screener respondent/adult education participant/female	273	77.9	237	78.2
Screener respondent/adult education nonparticipant/male	145	79.2	129	81.1
Screener respondent/adult education nonparticipant/female	222	82.1	189	82.5
Not Screener respondent/both participation statuses/both sexes	307	40.4	273	40.7

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program, 2007.

The variability in the nonresponse adjusted person-level weights was examined by population subgroups to determine whether trimming would be desirable. For the SR, PFI, and AEWR person-level weights, there was not enough variability to justify trimming.

4. The final stage of person-level weighting involved raking the nonresponse-adjusted person-level weights, *NPW*, to national control totals. Raking was proposed by Deming and Stephan (1940) as a way to ensure consistency between complete counts and sample data from the 1940 U.S. Census of population. The raking procedure typically improves the reliability of survey estimates, and also corrects for the bias due to persons not covered by the survey. Additionally, raking provides the ability to generate population estimates that match external estimates, in particular for the Bias Study, to generate population estimates comparable to the RDD sample. The raking procedure is carried out in a sequence of adjustments: first, the base weights are adjusted to one marginal distribution (or dimension) and then 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 of weighted totals to all sets of marginal distributions is achieved. (See Deming and Stephan 1940 for further details on raking and the convergence process.)

   This additional raking adjustment, following the household-level poststratification adjustment, is required because the extended interviews involve new eligibility criteria

and a new level of sampling. That is, although the household-level poststratification adjustment aligned the weighted totals of the household weights with the household-level control totals, the raking of the person-level weights is required in order to align the person-level weights with the person-level control totals and adjust for differential coverage rates at the person level.

The raking procedure for the SR and PFI weights involved raking the nonresponse-adjusted person-level weights to national totals obtained using percentage distributions from the October 2005 Current Population Survey (CPS) and the total number of children from the March 2006 CPS. The October 2005 CPS contains variables not available on the March 2006 CPS, but the totals in the latter are more current. The control total for a raking cell is the proportion in that cell from the October 2005 CPS multiplied by the estimate of the total number of children from the March 2006 CPS.

The four raking dimensions used for the SR interview weights were race/ethnicity of the child (Black, non-Hispanic/Hispanic/other), household income categories ($25,000 or less/$25,001 or more), a cross of census region (Northeast/South/ Midwest/West) and urbanicity (urban/rural), and a cross of home tenure (rent/own or other) and grade of child (with those enrolled in school but having no grade equivalent assigned to the modal grade for their age). The three raking dimensions used for the PFI interview weights were a cross between race/ethnicity of the child (Black, non-Hispanic/Hispanic/other) and household income categories ($10,000 or less/$10,001–$25,000/$25,001 or more), a cross of census region (Northeast/South/Midwest/West) and urbanicity (urban/rural), and a cross of home tenure (rent/own or other) and grade of child (with those enrolled in school but having no grade equivalent assigned to the modal grade for their age). These raking variables were the same ones used in the RDD sample weighting, but with some collapsing of categories because of smaller sample sizes. This collapsing of categories was done in order to make the raking adjustment more stable. In general this would be expected to result in less variation in the weights and, therefore, a decrease in variances, relative to what the variances would have been if collapsing had not been done. For the RDD survey, these raking dimensions were used because they include important analysis variables (e.g., grade) and characteristics that have been shown to be associated with telephone coverage (e.g., race/ethnicity) (Blumberg and Luke 2006).Tables 6-5 and 6-6 show the control totals used for raking the SR and PFI interview weights, respectively.

For the AEWR interview, the four dimensions for the raking cells were a cross of the adult's race/ethnicity (Black, non-Hispanic/Hispanic/other) and household income ($10,000 or less/$10,001-$25,000/$25,001 or more), a cross of age (16–29 years/30–49 years/50 years or more) and sex, a cross of census region (Northeast/South/ Midwest/West) and urbanicity (urban/rural), and a cross of home tenure (rent/own or other) and highest educational attainment (less than high school diploma/high school diploma or equivalent/some college). These raking dimensions were generally the same ones used for the RDD sample; however, the cross of age, sex, and household size was replaced with age by sex, and collapsing across regions in rural areas. The collapsing of categories was necessary because of smaller sample sizes for the Bias Study sample. The elimination of household size as a raking variable for the Bias Study sample is justifiable, since it was used in the RDD weighting to account for any

noncoverage of single, young males based on evidence of higher rates of cell-phone only households among this group, which is not an issue in the area sample.

Table 6-5. Control totals for raking the School Readiness (SR)-NHES:2007 person-level interview weights: NHES:2007 Bias Study

Total		8,734,486
Race/ethnicity of child		Control total[2]
Black, non-Hispanic		1,319,184
Hispanic		1,918,622
Other		5,496,680
Household income		Control total[2]
$25,000 or less		2,331,634
$25,001 or more		6,402,852
Census region[1]	Urbanicity	Control total[2]
Northeast	All	1,417,809
South	Urban	2,301,791
South	Rural	858,488
Midwest	Urban	1,539,271
Midwest	Rural	521,193
West	All	2,095,934
Home tenure	Age/grade of child	Control total[2]
Rent	Unenrolled	1,714,544
Rent	Preschool	1,350,853
Own or other	Unenrolled	2,429,177
Own or other	Preschool	3,239,912

[1] The following states and the District of Columbia are in each census region: Northeast: CT, MA, ME, NH, NJ, NY, PA, RI, VT; South: AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV; Midwest: IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI; West: AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY.

[2] The control totals are numbers of people.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March 2006 and October 2005.

Table 6-6. Control totals for raking the Parent and Family Involvement in Education (PFI)-NHES:2007 person-level interview weights: NHES:2007 Bias Study

Total		53,185,978
Race/ethnicity of child	Household income	Control total[2]
Black, non-Hispanic	$10,000 or less	1,672,661
Black, non-Hispanic	$10,001-$25,000	1,998,302
Black, non-Hispanic	$25,001 or more	4,226,716
Hispanic	$10,000 or less	952,408
Hispanic	$10,001-$25,000	2,735,705
Hispanic	$25,001 or more	6,240,396
Other	$10,000 or less	1,416,805
Other	$10,001-$25,000	3,411,705
Other	$25,001 or more	30,531,280
Census region[1]	Urbanicity	Control total[2]
Northeast	Urban	8,046,784
Northeast	Rural	1,488,933
South	Urban	13,986,891
South	Rural	5,216,625
Midwest	Urban	8,749,595
Midwest	Rural	2,962,588
West	Both urbanicities	12,734,562
Home tenure	Grade of child	Control total[2]
Rent	Transitional kindergarten/kindergarten/pre-1st grade	1,186,672
Rent	1st grade	1,328,422
Rent	2nd grade	1,166,716
Rent	3rd grade	1,216,608
Rent	4th grade	1,082,817
Rent	5th grade	1,105,484
Rent	6th grade	1,045,527
Rent	7th grade	1,045,227
Rent	8th grade	1,124,203
Rent	9th grade	1,113,763
Rent	10th grade	1,081,231
Rent	11th grade	918,851
Rent	12th grade	757,865
Own or other	Transitional kindergarten/kindergarten/pre-1st grade	2,715,226
Own or other	1st grade	2,806,353
Own or other	2nd grade	2,750,847
Own or other	3rd grade	2,698,323
Own or other	4th grade	2,767,402
Own or other	5th grade	2,941,790
Own or other	6th grade	3,007,403
Own or other	7th grade	3,097,426

See notes at end of table.

Table 6-6. Control totals for raking the Parent and Family Involvement in Education (PFI)-NHES:2007 person-level interview weights: NHES:2007 Bias Study—Continued

Home tenure—Continued	Age/grade of child—Continued	Control total[2]
Own or other	8th grade	3,115,756
Own or other	9th grade	3,157,928
Own or other	10th grade	3,283,568
Own or other	11th grade	3,496,583
Own or other	12th grade	3,173,987

[1] The following states and the District of Columbia are in each census region: Northeast: CT, MA, ME, NH, NJ, NY, PA, RI, VT; South: AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV; Midwest: IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI; West: AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY.
[2] The control totals are numbers of people.
NOTE: Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March 2006 and October 2005.

The control totals for raking the AEWR interview weights, shown in table 6-7, were obtained from the March 2006 CPS. The raking iterations were continued until the estimated totals were within 1 of all the control totals.

The final person-level weight for each sampled person *jk* is

$$PW_{jk} = NPW_{jk} \cdot D_{jk(d)},$$

where $D_{jk(d)}$ is the raking adjustment factor for raking cell *d*, where person *jk* has the attributes corresponding to the levels of the dimensions of raking cell *d*.

Table 6-7. Control totals for raking the Adult Education for Work-Related Reasons (AEWR)-NHES:2007 person-level weights: NHES:2007 Bias Study

Total		216,827,342
Race/ethnicity	Household income	Control total[2]
Black, non-Hispanic	$10,000 or less	3,040,804
Black, non-Hispanic	$10,001-$25,000	5,143,163
Black, non-Hispanic	$25,001 or more	16,137,645
Hispanic	$10,000 or less	1,827,866
Hispanic	$10,001-$25,000	5,398,828
Hispanic	$25,001 or more	20,753,194
Other	$10,000 or less	7,481,096
Other	$10,001-$25,000	21,434,761
Other	$25,001 or more	135,609,985
Age	Sex	Control total[2]
16–29 years	Male	22,799,648
16–29 years	Female	22,825,035
30–49 years	Male	41,617,822
30–49 years	Female	42,862,494
50 years or more	Male	39,941,394
50 years or more	Female	46,780,949
Urbanicity	Census region[1]	Control total[2]
Urban	Northeast	34,452,602
Urban	South	57,024,617
Urban	Midwest	36,023,610
Urban	West	43,867,176
Rural	All regions	45,459,337
Home tenure	Educational attainment	Control total[2]
Rent	Less than high school diploma	13,341,302
Rent	High school diploma or equivalent	30,037,210
Rent	Some college	14,598,715
Own or other	Less than high school diploma	18,474,160
Own or other	High school diploma or equivalent	81,142,050
Own or other	Some college	59,233,905

[1] The following states and the District of Columbia are in each census region: Northeast: CT, MA, ME, NH, NJ, NY, PA, RI, VT; South: AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV; Midwest: IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI; West: AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY.

[2] The control totals are numbers of people.

NOTE: Details may not sum to totals because of rounding.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March 2006.

6.3 Chi-Square Automatic Interaction Detection (CHAID) Analysis

As mentioned in section 6.2, Screener nonresponse adjustment cells for weighting were formed based on the results from an analysis used to identify characteristics most associated with Screener nonresponse. A univariate profile of Screener unit response rates by the characteristics of the geographic areas, as presented in chapter 5, is difficult to interpret because there are many characteristics and some of the characteristics are correlated. In order to study the interrelationships among characteristics and the Screener unit response rate, a multivariate analysis was conducted. The goal of the multivariate analysis was to better understand the complex relationships among the characteristics by examining the characteristics simultaneously with regard to unit response rates, and to determine if groups of households had extremely different unit response rates. Nonresponse bias in the estimates may appear when the characteristics of the respondents and nonrespondents are different. (See chapter 2 for a more detailed discussion of the relationship between response propensities and nonresponse bias.) By identifying groups with different unit response rates, the characteristics of the respondents and nonrespondents can be used as an indicator of the potential for nonresponse bias, and thus using these characteristics to form cells for nonresponse adjustment may reduce nonresponse bias (Little 1986).

The characteristics of the geographic areas corresponding to the sampled addresses were used to identify groups with different unit response rates. The multivariate analysis was done using a categorical search algorithm called Chi-Square Automatic Interaction Detection (CHAID). This algorithm is similar to the continuous search algorithms LISREL and Automatic Interaction Detector (AID) that have been used for a number of years, but it is designed especially to handle categorical data like those available for the Bias Study sample. CHAID first identifies the characteristic of the data that is the best predictor of response. Then, within the levels of that characteristic, CHAID identifies the next most likely response predictor(s), and so forth, until a tree is formed with all potential response predictors. The final result is a division of the entire dataset into cells by attempting to determine sequentially the cells that have the greatest discrimination with respect to the unit response rates. In other words, it divides the dataset into groups so that the unit response rate within cells is as constant as possible, and the unit response rate between cells is as different as possible. This automatic procedure was done by specifying that the minimum number of households in any group had to be greater than or equal to 100 and the split of the variables into subgroups had to be statistically significant using a chi-square test at the 95 percent significance level.

Since many of the variables in the CHAID model, such as median home value, have multiple response categories, the program must take this into account. The CHAID software does this in two ways. First, it allows the dataset to be split into subgroups separately within each level of the characteristic chosen in the previous round of CHAID selection. For example, census division categories are grouped differently within each of the phone number match categories. (For an example, see table 6-1.) Second, the procedure selects variables irrespective of the number of response categories that variable may have since the procedure collapses categories together to get meaningful categories.

All of the characteristics in the model are tested, and the one with the response categories having the largest discrimination with respect to the unit response rates is identified.[37] Table 6-1 contains the summary of this analysis as it relates directly to weighting the data. In this case, telephone number match was the variable chosen as most associated with response propensity. Among cases without a telephone number match, census division was identified as the characteristic next-most-associated with response propensity. Among cases with a telephone number match, whether an answering machine message was left was identified as the characteristic next-most-associated with response propensity. The process of identifying the characteristic most associated with Screener response propensity, conditional on the characteristics already identified, continued until the final 20 cells shown in table 6-1 were formed. In addition to telephone number match status, census division, and the answering machine message indicator, the final 20 cells were formed using percent White in the ZIP code and median home value in the ZIP code. Although the ZIP code-level variables (i.e., percent Black, percent Asian, percent Hispanic, percent renters, college graduates and household income decile) were considered in the CHAID analysis, they were not selected as discriminators of response propensity in this multivariate analysis, given the other characteristics. The range of unit response rates among some of the cells suggests that interactions among some characteristics may be present. For example, for cells 1 through 5 (phone number matched cases in the New England, South Atlantic, or Pacific census divisions), the Screener unit response rates range from 48 to 79 percent.

[37] Variables identified in previous analyses as being associated with response propensity were selected from among the variables available for both responding and nonresponding units. For the Bias Study, little information is available for nonresponding households, limiting the selection of characteristics for the CHAID analysis. Information associated with key characteristics of interest, such as participation in early childhood programs, activities, or adult education, and correlates of these, such as maternal employment or educational attainment, are not available for nonrespondents, and therefore cannot be used for nonresponse adjustment purposes.

The range of unit response rates among the 20 cells suggested that the key characteristics identified by CHAID should be used in creating weighting adjustments. As a result, these 20 cells were used in the adjustment for Screener nonresponse. These results suggest that the weighting adjusts for some of the important characteristics associated with nonresponse bias.

6.4 Sampling Errors

In surveys with complex sample designs, such as NHES:2007, direct estimates of the sampling errors assuming a simple random sample will typically underestimate the variability in the estimates (Wolter 1985). The NHES:2007 Bias Study sample design and estimation included procedures that deviate from the assumption of simple random sampling, such as oversampling addresses with a phone number match, sampling persons within households with differential probabilities, and raking to control totals.

One method for computing sampling errors to reflect these aspects of the sample design and estimation is the replication method. Replication involves splitting the entire sample into a set of groups or replicates based on the actual sample design of the survey. The survey estimates can then be computed for each of the replicates by creating replicate weights that mimic the actual sample design and estimation procedures used in the full sample. The variation in the estimates computed from the replicate weights can then be used to estimate the sampling errors of the estimates from the full sample. The replication method was used to produce the standard errors of estimates for the bias analysis. All standard error calculations were performed using the WesVar software.

A total of 80 replicates were defined for NHES:2007 Bias Study sample. This number was chosen to match the number of replicates for the RDD survey. The specific replication procedure used for NHES:2007 Bias Study was the jackknife (JKn) replication method (Wolter 1985).[38] It involved dividing the sample into 80 random subsamples (replicates) for the computation of the replicate weights. The first 39 replicates were formed based on the sample design, and the remaining 41 replicates were "pseudo" replicates in which the full sample weights were used. The extra 41 replicates do not contribute anything to the variance but were created to simplify variance calculations. In each replicate, a replicate weight was developed using the same weighting procedures that were used to develop the full sample weight.

[38] The jackknife (JK1) replication method was used for the RDD sample weights. A description can be found in Hagedorn et al. (2008).

Replicate weights were created for each of the NHES:2007 surveys: the SR, the PFI, and the AEWR. The procedures for forming the Bias Study replicate weights for each of these surveys are described below. The procedure for the RDD sample can be found in Hagedorn et al (2008).[39]

1. Variance strata and variance units were formed to reflect the sample design. For the 29 noncertainty PSUs, variance strata were defined as the strata used for sampling (see section 3.2), which contained 2 or 3 sampled PSUs (variance units) per stratum. For the 1 certainty PSU, 5 variance strata were formed by pairing sampled segments (variance units) within the PSU.

2. The first 39 replicates were created using the JKn method. The replicate 1 base weights were assigned by multiplying the full-sample base weight for the first variance unit in the first variance stratum by zero and the other variance units in the first variance stratum by a factor of $n_h/(n_h - 1)$, where n_h is the number of variance units in the variance stratum (equal to 2 for the first variance stratum). The full sample weights for all variance units in the remaining variance strata were multiplied by a factor of 1. This process was repeated for each of the remaining variance units to form the rest of the 39 replicates. The weights for replicates 40 through 80 were set equal to the full sample weights.

3. Using the exact same weighting procedures described earlier in this chapter for each of the sets of full sample weights, the other adjustments (i.e., sampling adjustments, nonresponse adjustments, and raking adjustments) were applied to every replicate base weight for completed interviews. In other words, the weighting steps were applied 80 times.

4. The difference in the methods used for the full sample and for the replicate weights was that the raking iterations were stopped when the replicate weights converged to within 10 of the control totals rather than 1, which was used in the full sample weighting.

The replication procedure for the NHES:2007 surveys involves the calculation of 81 estimates, including an estimate using the full sample weight and estimates using each of the 80 replicate weights.

The JKn variance estimator, $v\left(\hat{\theta}\right)$, has the form

$$v\left(\hat{\theta}\right) = \sum_{k=1}^{G} \frac{n_k - 1}{n_k} \left(\hat{\theta}_{(k)} - \hat{\theta}\right)^2 ,$$

[39] The procedures for forming replicates for the NHES:2007 RDD sample are the same as the procedures used in NHES:2005. (See Hagedorn et al. 2006.)

where θ is the population parameter of interest; $\hat{\theta}$ is the estimate of θ based on the full sample; $\hat{\theta}_{(k)}$ is the estimate of θ based on the observations included in the *k*th replicate; and n_k is number of variance units in the variance stratum corresponding to replicate *k*.

6.5 Significance Tests

All differences discussed in this report are significant at the 95 percent confidence level, based on a 2-sided *t*-test. While some relatively small differences (3 to 5 percentage points) might be statistically significant when sample sizes are large, the discussion is limited to differences that are potentially of substantive importance. Differences of substantive importance are defined as differences of 5 percentage points or more or relative differences of 3 or more (i.e., when one estimate is 3 or more times larger than the other). The Bias Study was designed to allow detection of a 5 percentage point difference in key statistics. For NHES, this is considered a meaningful threshold to use to identify which statistically significant differences are of substantive significance.

When the comparison involves correlated samples, the standard error in the *t*-test was calculated to appropriately account for the correlation. An example of a comparison with correlated samples is the nonresponse bias analysis, in which the bias is the difference between the estimate from the reduced treatment method, which includes only Bias Study respondents finalized in the TRC or with no matching telephone number or a mismatched number, and the full treatment method, which includes all Bias Study respondents.

This page is intentionally blank.

7. AN OVERVIEW OF BIAS

This chapter provides an overview of the bias in the NHES:2007 estimates. Section 7.1 provides some methodological issues to consider when comparing the estimates from the NHES:2007 Bias Study sample to estimates from other sources. The estimates from the Bias Study sample are intended to give an indication of the bias in the random digit dialing (RDD) sample estimates. However, the Bias Study estimates are themselves potentially subject to bias. Section 7.2 compares the estimates from the Bias Study sample to those from an external source as a check of the reasonableness of the Bias Study estimates; the external source used for this comparison is the Current Population Survey (CPS). The Bias Study sample and RDD sample estimates are computed using weights adjusted for nonresponse and raked to population totals, as described in chapter 6. To evaluate the effect of the weighting adjustments on bias in the RDD estimates, section 7.3 contains a comparison of NHES:2007 RDD estimates before and after the adjustments. In section 7.4, the Bias Study estimates are compared to the final, adjusted estimates from the NHES:2007 RDD sample. Differences reflect the overall bias in the RDD sample estimates, including nonresponse and noncoverage bias. A breakdown of the components of bias is given in chapter 8.

7.1 Methodological Considerations in Data Comparisons

Sample and nonsampling errors, sample sizes, methods of survey administration, the timing of surveys, and response rates all affect the data collected and any comparisons made (Bradburn 1983; Groves 1989). In addition, question wording variation, question order, question context, and respondent recall can have a major impact on survey responses (Bradburn 1983; Groves 1989). While comparisons of the Bias Study estimates and RDD sample estimates are intended to give an indication of the noncoverage and nonresponse bias in the RDD estimates, the differences might also be attributable to noncoverage or nonresponse in the Bias Study sample as well as other sources of sampling or nonsampling error. Similar issues are important when comparing the Bias Study estimates to external sources. As a result, it is important to note some general methodological issues.

Every survey, including the NHES:2007 Bias Study, is subject to both sampling error and nonsampling error. Sampling errors occur because the data are collected from a sample rather than a census of the population. Because the sample of addresses selected for the Bias Study is just one of the many possible samples that could have been selected, estimates produced from the Bias Study sample may differ from estimates that would have been produced from other samples. In the same way, the data

from the NHES:2007 RDD sample and the CPS are also subject to sampling error. Nonsampling errors are errors made in the collection and processing of data and may be caused by population coverage limitations and data collection, processing, and reporting procedures. The sources of nonsampling error are typically problems like unit and item nonresponse, the differences in respondents' interpretations of the meaning of the questions, response differences related to the particular time the survey was conducted, and mistakes in data preparation. Although the NHES surveys are designed to account for sampling error and minimize nonsampling error, the estimates presented in this chapter are subject to both types of error. These types of errors are not unique to NHES, but are common to all sample surveys.

Population coverage is an issue that arises in the examination of results of any telephone survey because households without telephones are excluded from the sample. The NHES:2007 RDD data, which were obtained from a sample of residential landline telephone numbers, were statistically adjusted to reduce the effects of population noncoverage due to lack of telephone ownership. As a result, the estimates from RDD sample sum to the total number of eligible persons in all households, not just those in households with telephones. Although these statistical adjustments may be useful in reducing biases in aggregates for the whole population, more serious biases may exist for estimates of segments of the population with relatively low telephone coverage rates (Brick, Burke, and West 1992). Unlike the RDD sample, the Bias Study sample includes households without telephones. However, it is still subject to population noncoverage. The address lists used for sampling have been shown to provide poorer coverage of rural areas (O'Muircheartaigh, Eckman, and Weiss 2002). The Bias Study data were statistically adjusted to reduce the effects of population noncoverage (see chapter 6), but some noncoverage bias might still remain.

Timing of survey administration in terms of the years in which surveys were conducted or the time of year they were administered also may affect responses (Groves 1989). The time of the year when the data are collected can affect responses to questions related to specific topics such as school attendance. It is important to keep in mind that the data collection period can be an important factor to consider when comparing Bias Study and CPS estimates. The Telephone Research Center (TRC) data collection periods for the NHES:2007 Bias Study sample and RDD sample were the same.

Variation in response rates across surveys can also result in differences in the estimates. To the extent that nonrespondents are different from respondents, low response rates may introduce biases into the survey estimates. In the Bias Study, the overall unit response rate was 54.0 for School Readiness (SR), 51.4 for Parent and Family Involvement in Education (PFI), and 41.0 for Adult Education for Work-Related Reasons (AEWR). For the RDD sample, the overall unit response rate was 40.7 percent for SR, 39.1 percent for PFI, and 33.0 percent for AEWR. These response rates are given in table 5-6, and

unit response rates for NHES:2007 are discussed more thoroughly in chapter 5. Unit response rates for the comparable data sources discussed in this chapter were 83.3 percent for CPS March 2006 and 89.5 percent for CPS October 2005.

The mode of administration (e.g. telephone interview versus face-to-face interview) is another factor related to responses (Groves 1989). For example, differences in mode can affect question wording, question context, or the interviewer-respondent interaction. Interviews were conducted by telephone for the NHES RDD sample, the Bias Study reduced treatment, and the Bias Study full treatment (see chapter 4). Therefore, differences in these estimates can not be attributed to mode effects.

Because NHES data are adjusted with a raking procedure to match CPS population totals, the Bias Study and RDD sample estimates exactly match CPS estimates for the characteristics used in the raking, provided the categorization is the same as that used in raking. Because the standard error of an estimate is a measure of sampling error variance, a standard error of 0 indicates the absence of sampling error variance. When NHES estimates of totals are adjusted to exactly match CPS totals (through the raking adjustment), all sampling error in those estimated totals is eliminated, under the assumption that the CPS total is the true population value. Any NHES estimate of a characteristic not specifically controlled for in the raking adjustment would not be expected to exactly match CPS totals for one or more of the reasons discussed earlier in this section.

7.1.1 General Comments on the Comparisons

The estimates to be presented here are just some of the multitude of comparisons that could be made between NHES:2007 Bias Study estimates and the RDD sample and CPS estimates using different variables and categorizations of those variables. The items included in these comparisons were selected because they include important characteristics of persons and households, or because they are key outcome variables from the surveys. When many comparisons are made, some will undoubtedly show statistically significant differences. The main purpose of the comparisons is to explore the overall quality of the data and to determine whether there are some differences in estimates of substantive importance that need to be investigated further.

7.1.2 Other Data Considerations

As is true for most surveys, responses were not obtained for all the NHES:2007 data items for all interviews. Despite the high item response rate, all NHES:2007 missing data items were imputed. The median Bias Study item response rates for items in the SR, PFI, and AEWR surveys were 99.3, 99.4, and 99.8 percent, respectively.[40] The CPS estimates provided as comparison data also contain imputed data.

Another data consideration is age. The CPS includes respondents ages 15 and older, whereas Adult Education for Work-Related Reasons (AEWR)-NHES:2007 Bias Study adults were at least 16 years old. For the purpose of the comparisons pertaining to adults in this chapter, this difference in the age subgroup was accounted for by restricting tabulations of the CPS data to persons ages 16 and older.

7.2 Comparison of NHES:2007 Bias Study Estimates to an External Source

This section presents a comparison for selected estimates from the NHES:2007 Bias Study with estimates from the CPS. In the bias analysis presented in section 7.4, estimates from the full Bias Study will be used as the standard by which to evaluate bias in the RDD estimates, since the response rates for the Bias Study are higher than for the main study RDD sample, and undercoverage bias from the address-based sampling frame is believed to be less of an issue than undercoverage from the RDD sampling frame. The comparison in this section is intended to provide an indication of the reasonableness of the selected NHES:2007 Bias Study estimates for this purpose. The CPS was selected for this comparative analysis because it included topical information and samples comparable to those used in the NHES:2007 surveys. Historically, the CPS has been used as the extant source to which NHES demographic estimates have been compared. For these comparisons, the SR, PFI, and AEWR Bias Study estimates were calculated using adjusted weights.

7.2.1 Current Population Survey (CPS)

The CPS is a monthly household survey conducted by the Bureau of the Census to provide information about employment, unemployment, and other characteristics of the civilian noninstitutionalized population. The CPS respondent is a household member age 15 or older and the

[40] The median RDD Study item response rates for items in the SR, PFI, and AEWR surveys were 99.3, 99.0, and 99.7 percent, respectively.

survey is conducted each month with a sample of approximately 72,000 households located in 754 primary sampling units. The U.S. Department of Education is a joint sponsor of the annual October supplement to the CPS, which provides specific information on educational topics.

CPS data from October 2005 and March 2006[41] were used for comparison with estimates from SR, PFI, and AEWR surveys. The October 2005 supplement contains the most recently available CPS data regarding enrollment status and grade by type of school in which students are enrolled, and the March 2006 supplement contains the most recent CPS data on age, race/ethnicity by educational attainment, industry, and occupation. The October 2005 CPS data were collected on 71,270 households and 137,809 individuals; and the March 2006 CPS data were on 71,700 households and 135,028 individuals. The data comparisons below for SR, PFI, and AEWR cover key estimates including ages of subject, student grade, enrollment status, school type, sex, and highest level of educational attainment.

The CPS public-use data files do not contain the information required to compute standard errors directly. However, the CPS provides documentation on computing approximate standard errors using generalized variance functions (GVFs). GVFs are functions that model the variance (or standard error) of survey estimates based on the value of the estimates. Further information on the CPS GVFs can be found on the CPS website, at http://www.census.gov/cps. The GVFs were used to obtain approximate standard errors for each of the CPS estimates presented in this chapter.

7.2.2 Comparability of the NHES:2007 Bias Study and CPS Distributions

Age of persons. Table 7-1 shows NHES:2007 Bias Study and 2005 CPS estimates of the age distribution of the population as indicated by the age of persons who were subjects of NHES interviews (i.e., children/youth from ages 3 to 20 and enrolled in grade 12 or below and noninstitutionalized adults ages 16 or older and not enrolled in grade 12 or below). All observed differences are 1 percentage point or less, with estimates not exhibiting statistically significant differences when applying 95 percent confidence intervals.

School type and student grade level. Estimates of the number of children enrolled in kindergarten through grade 12, by school type and by student grade level, are presented in table 7-2 for the Bias Study PFI survey and for CPS:2005. Estimates of the number of children at each grade level from kindergarten through grade 12 are not significantly different. Number estimates are rounded to the

[41] The October 2005 and March 2006 CPS data were the most recent available at the time this report was drafted. Generally, the CPS shows little variation over 1- and 2-year time spans.

nearest thousand for ease of interpretation. The NHES:2007 Bias Study estimates show that there were 53,186,000 children enrolled in kindergarten through grade 12, and the CPS:2005 estimates show that there were 53,328,000 children (a difference of 142,000 children or 0.3 percent of the NHES estimate). The percentage distributions for grade are nearly identical between NHES:2007 and CPS:2005 because grade was used for raking. The numbers of children enrolled in public and private school are also comparable.

Table 7-1. Percentage distribution for age of subjects of interviews: SR-NHES:2007 Bias Study, PFI-NHES:2007 Bias Study, AEWR-NHES:2007 Bias Study, and CPS:2005

	SR-NHES:2007 Bias Study, PFI-NHES:2007 Bias Study and AEWR-NHES:2007 Bias Study[1]		CPS:2005	
Age category	Percent	s.e.	Percent	s.e.
3–5 years	4	0.1	4	0.1
6–9 years	6	0.1	6	0.1
10–15 years	9	0.2	9	0.1
16–19 years	5	0.6	6	0.1
20–29 years	15	0.5	14	0.1
30–39 years	13	0.9	14	0.1
40–49 years	17	0.9	16	0.1
50–59 years	14	1.0	14	0.1
60 or more years	17	1.0	17	0.1

[1] Estimates of children ages 3 through 6 and not yet enrolled in kindergarten were obtained from the School Readiness (SR) Survey. Estimates of children/youth ages 3 through 20 and enrolled in kindergarten through grade 12 were obtained from the Parent and Family Involvement in Education (PFI) Survey. Estimates of adults ages 16 and older, not enrolled in grade 12 or below, and not on activity duty in the U.S. Armed Forces were obtained from the Adult Education for Work-Related Reasons (AEWR) Survey. Parent respondents to the SR and PFI Surveys are not included in calculations for adult estimates.

NOTE: s.e. is standard error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, School Readiness Survey of the National Household Education Surveys Program (NHES), 2007; Parent and Family Involvement in Education Survey of the NHES, 2007; and Adult Education for Work-Related Reasons Survey of the NHES, 2007. U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October 2005.

Table 7-2. Number of children in kindergarten through grade 12, by school type and by student grade level: PFI-NHES:2007 Bias Study and CPS:2005

School type and grade	PFI-NHES:2007 Bias Study		CPS:2005	
	Number (thousands)	s.e. (thousands)	Number (thousands)	s.e. (thousands)
Total number of children in kindergarten through 12th grade	53,186	0	53,328	330
School type[1]				
Public	46,867	801	48,018	320
Private	5,269	868	5,309	124
Homeschooled	1,050	273	—	—
Student grade level				
Kindergarten	3,902	0	3,912	107
1	4,135	0	4,146	110
2	3,918	0	3,928	107
3	3,950	40	3,925	107
4	3,850	0	3,860	106
5	4,012	40	4,058	109
6	4,053	0	4,064	109
7	4,143	0	4,154	110
8	4,240	0	4,251	111
9	4,272	0	4,283	112
10	4,365	0	4,376	113
11	4,415	0	4,427	113
12	3,932	0	3,942	107

[1] CPS does not isolate homeschoolers, some of whom may also be attending school for a certain number of hours per week.
NOTE: s.e. is standard error. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education Survey of the National Household Education Surveys Program, 2007; and U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October 2005.

Table 7-3 shows estimates of the number of children enrolled in kindergarten through grade 12 in public versus private schools. There are no statistically significant differences of 5 percentage points or more between PFI-NHES:2007 Bias Study and CPS:2005 with respect to enrollment in public and private schools across grade levels.

Table 7-3. Number and percentage of children in kindergarten through grade 12 enrolled in public and private schools: PFI-NHES:2007 Bias Study and CPS:2005

	School type					
	Public			Private		
Child's current grade	Number (thousands)	Percent	s.e.	Number (thousands)	Percent	s.e.
PFI-NHES:2007 Bias Study						
K	3,204	84	5.9	611	16	5.9
1, 2	7,129	92	1.9	611	8	1.9
3, 4	7,103	94	2.1	438	6	2.1
5, 6	6,861	88	3.5	966	12	3.5
7, 8	7,538	90	3.9	844	10	3.9
9, 10	7,519	88	3.1	1,039	12	3.1
11, 12	7,514	91	3.2	760	9	3.2
CPS:2005						
K	3,349	86	1.0	563	14	1.0
1,2	7,153	89	0.6	921	11	0.6
3,4	7,031	90	0.6	755	10	0.6
5, 6	7,270	90	0.6	852	10	0.6
7, 8	7,574	90	0.6	831	10	0.6
9, 10	7,967	92	0.5	692	8	0.5
11, 12	7,675	92	0.5	695	8	0.5

NOTE: s.e. is standard error. For the National Household Education Surveys Program: 2007, kindergarten (K) includes grades reported as kindergarten, transitional kindergarten, and prefirst grade. Children who are homeschooled are not included.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education Survey of the National Household Education Surveys Program, 2003; and U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October 2005.

Household income: SR. Table 7-4 presents Bias Study SR and CPS estimates of the percentage of children ages 3 through 6, not yet enrolled in kindergarten who resided in households with particular income categories. Across income categories, estimates from both surveys are comparable.

Table 7-4. Percentage of children ages 3 through 6 not yet enrolled in kindergarten, by household income: SR-NHES:2007 Bias Study and CPS:2005

	SR-NHES:2007 Bias Study		CPS:2005	
Household income	Percent	s.e.	Percent	s.e.
$15,000 or less	15	1.7	15	0.7
$15,001 to $30,000	18	2.4	18	0.8
$30,001 to $50,000	18	2.8	21	0.8
Over $50,000	50	2.9	47	1.0

NOTE: s.e. is standard error. Current Population Survey estimates exclude cases with missing income data. Because of rounding, percentages may not add to 100.
SOURCE: U.S. Department of Education, National Center for Education Statistics, School Readiness Survey of the National Household Education Surveys Program, 2007; and U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October 2005.

Household income by race/ethnicity: SR. Table 7-5 compares SR-NHES:2007 Bias Study and CPS:2005 estimates of household income by race/ethnicity for children ages 3 through 6, not yet enrolled in kindergarten. For preschoolers of a race/ethnicity other than White, non-Hispanic, the percentage with a household income from $30,001 to $50,000 is higher for the CPS than the Bias Study sample. The rest of the estimates are comparable.

Table 7-5. Number and percentage of children ages 3 through 6 not yet enrolled in kindergarten, by household income and race/ethnicity: SR-NHES:2007 Bias Study and CPS:2005

		Household income							
	Number of children	Less than $15,000		$15,001 to $30,000		$30,001 to $50,000		More than $50,000	
Race/ethnicity	(thousands)	Percent	s.e.	Percent	s.e.	Percent	s.e.	Percent	s.e.
SR-NHES:2007 Bias Study									
White, non-Hispanic	4,933	9	2.3	10	1.9	21	3.8	60	4.6
Other	3,801	23	3.7	28	5.2	13	3.2	36	4.9
CPS:2005									
White, non-Hispanic	4,882	8	0.7	11	0.8	21	1.1	60	1.3
Other	3,876	24	1.3	27	1.3	21	1.2	29	1.4

Rounds to zero.
NOTE: Shading indicates a significant difference of 5 percentage points or more. s.e. is standard error. Current Population Survey percentage estimates exclude cases with missing income data. Because of rounding, percentages may not add to 100.
SOURCE: U.S. Department of Education, National Center for Education Statistics, School Readiness Survey of the National Household Education Surveys Program, 2007; and U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October 2005.

Household income: PFI. Table 7-6 presents PFI-NHES:2007 Bias Study and CPS:2005 estimates of the percentage of children in kindergarten through grade 12, who resided in households with particular income ranges. Across income categories, estimates from both surveys are comparable; the observed differences of 4 percentage points or less were not significant.

Table 7-6. Percentage of children in kindergarten through grade 12, by household income: PFI-NHES:2007 Bias Study and CPS:2005

	PFI-NHES:2007 Bias Study		CPS:2005	
Household income	Percent	s.e.	Percent	s.e.
$15,000 or less	13	0.6	13	0.3
$15,001 to $30,000	15	1.2	16	0.3
$30,001 to $50,000	17	2.2	20	0.3
Over $50,000	55	2.2	51	0.4

NOTE: s.e. is standard error. Current Population Survey estimates exclude cases with missing income data. Because of rounding, percentages may not add to 100.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education Survey of the National Household Education Surveys Program, 2007; and U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October 2005.

Household income by race/ethnicity: PFI. Table 7-7 presents PFI-NHES:2007 Bias Study and CPS:2005 estimates of household income by race/ethnicity for children in kindergarten through grade 12. The estimates are comparable.

Table 7-7. Number and percentage of children in kindergarten through grade 12, by household income and race/ethnicity: PFI-NHES:2007 Bias Study and CPS:2005

		Household income							
	Number of children	Less than $15,000		$15,001 to $30,000		$30,001 to $50,000		More than $50,000	
Race/ethnicity	(thousands)	Percent	s.e.	Percent	s.e.	Percent	s.e.	Percent	s.e.
PFI-NHES:2007 Bias Study									
White, non-Hispanic	30,959	7	0.9	9	0.8	16	3.4	69	3.6
Other	22,227	22	1.5	24	3.0	18	2.5	37	3.5
CPS:2005									
White, non-Hispanic	31,689	6	0.3	10	0.3	19	0.4	64	0.5
Other	21,639	23	0.5	24	0.5	22	0.5	32	0.6

NOTE: s.e. is standard error. Current Population Survey percentage estimates exclude cases with missing income data. Because of rounding, percentages may not add to 100.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education Survey of the National Household Education Surveys Program, 2003; and U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October 2005.

Public and private schools by race/ethnicity. Estimates from PFI-NHES:2007 and CPS:2005 of the number and percent of children in kindergarten through grade 12 enrolled in public and private schools by race/ethnicity are presented in table 7-8. Estimates are comparable.

Table 7-8. Number and percentage of children in kindergarten through grade 12 in public and private schools, by race/ethnicity: PFI-NHES:2007 Bias Study and CPS:2005

	PFI-NHES:2007 Bias Study					CPS:2005				
	Number of children	Public		Private		Number of children	Public		Private	
Race/ethnicity	(thousands)	Percent	s.e.	Percent	s.e.	(thousands)	Percent	s.e.	Percent	s.e.
White, non-Hispanic	30,959	90	2.2	10	2.2	31,689	87	0.3	13	0.3
Other	22,227	90	2.1	10	2.1	21,639	94	0.3	6	0.3

NOTE: s.e. is standard error. Percentages include only those students for whom public/private enrollment was reported, that is, children whose parents indicated they were enrolled in school.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education Survey of the National Household Education Surveys Program, 2007; and U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October 2005.

Family structure and parents' highest level of education. Table 7-9 presents estimates of the percentage of children in kindergarten through grade 12 by family structure and by parents' highest level of education for PFI-NHES:2007 Bias Study and CPS:2005-2006. The estimate for the percentage of children who had both mother and father in the household was 6 percentage points higher in PFI-NHES:2007 Bias Study (74 percent) compared to CPS:2006 (68 percent), and the percentage of children who had a mother only in the household was 5 percentage points lower in PFI-NHES:2007 Bias Study (19 percent) compared to CPS:2006 (24 percent). In addition, the percentage of children whose parents' highest level of education was some college was 5 percentage points lower in PFI-NHES:2007 Bias Study (28 percent) compared to CPS:2005 (33 percent), and the percentage of children whose parents' highest level of education was graduate school was 5 percentage points higher in PFI-NHES:2007 Bias Study (18 percent) compared to CPS:2005 (13 percent). The reason for these differences are unclear but consistent with the differences observed between the CPS data and the NHES:2007 RDD survey (Hagedorn et al, 2008).

Table 7-9. Percentage of children in kindergarten through grade 12, by family structure and parents' highest level of education: PFI-NHES:2007 Bias Study and CPS: 2005–2006

Family and community characteristics	PFI-NHES:2007 Bias Study		CPS:2005-2006	
	Percent	s.e.	Percent	s.e.
Family structure				
Mother and father	74	1.8	68	0.4
Mother	19	1.6	24	0.3
Father	4	0.4	5	0.2
Nonparent guardian(s)	3	0.5	4	0.1
Parents' highest education				
Less than high school	7	1.2	9	0.2
High school graduate	25	2.3	24	0.3
Some college	28	2.1	33	0.4
College graduate	22	2.1	21	0.3
Graduate school	18	2.1	13	0.2

NOTE: Shading indicates a significant difference of 5 percentage points or more. s.e. is standard error. Mother and father refer to birth, adoptive, step, or foster parents. Because of rounding, percentages may not add to 100. In households with two mothers/female guardians or two fathers/male guardians, parents' highest level of education for PFI-NHES:2007 was derived by taking into account the education level of both parents. Current Population Survey percentage estimates by family structure are for children ages 5 through 17, excluding emancipated minors, from CPS March 2006. Current Population Survey percentage estimates by parents' highest education are approximated by highest education attainment within households, from CPS October 2005.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education Survey of the National Household Education Surveys Program (NHES), 2007; and U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October 2005 and March 2006.

Adult population, by sex and age. Table 7-10 shows estimates of the adult population by sex and age. As discussed in chapter 6, the AEWR weights were raked to control totals of age by sex from the CPS. Therefore, estimates from the two surveys are expected to be comparable. The age estimates for both males and females from AEWR-NHES:2007 Bias Study and CPS:2006 are not substantively different.

Table 7-10. Percentage distribution of the adult population, by sex and age: AEWR-NHES:2007 Bias Study and CPS:2006

	AEWR-NHES:2007 Bias Study				CPS:2006			
	Male		Female		Male		Female	
Age	Estimate	s.e.	Estimate	s.e.	Estimate	s.e.	Estimate	s.e.
Total number of adults[1] (thousands)	104,359	0	112,468	0	104,359	345	112,468	335
16 to 24 years	8	0.9	5	0.7	6	0.1	6	0.1
25 to 34 years	8	1.5	10	1.1	9	0.1	9	0.1
35 to 44 years	8	1.2	9	0.9	10	0.1	10	0.1
45 to 54 years	11	1.4	10	1.0	10	0.1	10	0.1
55 years and older	13	0.9	18	0.8	14	0.1	17	0.1

[1] Includes civilian, noninstitutionalized adults, ages 16 or older, not enrolled in elementary or secondary school, and not on active duty in the U.S. Armed Forces at the time of the interview.
NOTE: The percentages provided in this table are cell percentages. That is, for each data set, these percentages sum to 100 across all age-sex cells. Due to rounding, the percentages shown here may not sum to 100.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education for Work-Related Reasons Survey of the National Household Education Surveys Program, 2007. U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March 2006.

Adult population by highest educational attainment and race/ethnicity. Race/ethnicity was also used in raking the AEWR weights. Since CPS:2006 is the source of the control totals for raking NHES:2007, estimates of number of adults in each race/ethnicity group are expected to be comparable. The estimates of totals for the non-Hispanic White and other race/ethnicity groups shown in table 7-11 are not identical, however, because the NHES:2007 Bias Study data were raked to a three-category race/ethnicity variable (Black, non-Hispanic; Hispanic; and White, non-Hispanic or others), whereas a two-category race/ethnicity variable (White, non-Hispanic versus others) is used in the comparison.

As depicted in table 7-11, AEWR-NHES:2007 Bias Study and CPS:2006 estimates of educational attainment by race/ethnicity are comparable in most cases. However, the percentage of adults with less than a high school education for race/ethnicities other than White, non-Hispanic was 6 percentage points lower for the AEWR-NHES:2007 Bias Study than the CPS:2006; the reason for this difference is unclear.

Table 7-11. Percentage distribution of the adult population, by highest educational attainment and race/ethnicity: AEWR-NHES:2007 Bias Study and CPS:2006

Race/ethnicity	Number of adults (thousands)	Highest educational attainment: Less than high school		High school diploma		Associate's or some college		Bachelor's or higher	
		Percent	s.e.	Percent	s.e.	Percent	s.e.	Percent	s.e.
AEWR-NHES:2007 Bias Study									
Total adults[1]	216,827	15	0.1	31	1.4	29	1.3	26	1.0
White, non-Hispanic	153,894	12	1.1	30	2.3	29	1.9	29	2.2
All other races	62,933	20	2.5	32	4.9	29	3.7	19	3.8
CPS:2006									
Total adults	216,827	15	0.1	32	0.2	28	0.2	26	0.2
White, non-Hispanic	151,076	10	0.1	32	0.2	29	0.2	29	0.2
All other races	65,751	26	0.3	31	0.3	24	0.3	19	0.3

[1] Includes civilian, noninstitutionalized adults, ages 16 or older, not enrolled in elementary or secondary school, and not on active duty in the U.S. Armed Forces at the time of the interview.
NOTE: Shading indicates a significant difference of 5 percentage points or more. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education for Work-Related Reasons Survey of the National Household Education Surveys Program, 2007. U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March 2006.

Work for pay or income in the past 12 months. In table 7-12, the estimates of employment status from the AEWR-NHES:2007 Bias Study and CPS:2006 are presented for adults aged 16 or older. About 70 percent of adults reported that they worked for pay or income in the past 12 months in AEWR and about 69 percent reported working in CPS:2006.

Table 7-12. Percentage of adults who worked for pay or income in the past 12 months: AEWR-NHES:2007 Bias Study and CPS:2006

Work history, past 12 months	AEWR-NHES:2007 Bias Study		CPS:2006	
	Estimate	s.e.	Estimate	s.e.
Total number of adults[1] (thousands)	216,827	†	216,827	†
Worked in the past 12 months	70	1.8	69	0.2
Did not work in the past 12 months	30	1.8	31	0.2

† Not applicable.
[1] Includes civilian, noninstitutionalized adults, ages 16 or older, not enrolled in elementary or secondary school, and not on active duty in the U.S. Armed Forces at the time of the interview.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education for Work-Related Reasons Survey of the National Household Education Surveys Program (NHES), 2007. U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March 2006.

7.2.3 Summary

Overall, the comparisons of selected estimates from NHES:2007 Bias Study with comparable data from the CPS have provided an indication of the reasonableness in using the NHES:2007 Bias Study estimates as the standard by which to evaluate bias in the RDD estimates. Although the estimates presented here are just some of the multitude of comparisons that could be made between NHES:2007 Bias Study estimates and the CPS using different variables and categorizations, this approach has proven useful in determining whether significant differences in estimates exist.

7.3 Effect of the Weighting Adjustments on Bias

The NHES:2007 estimates were produced using weights that were adjusted for nonresponse and calibrated (raked) to population totals. These adjustments were intended to reduce the nonresponse and noncoverage bias in the estimates. The process for weighting the RDD sample was similar to that for the Bias Study sample, as described in chapter 6. The variables used in the weighting adjustments were chosen because they were related to response propensity, noncoverage, and the key survey statistics. A complete description of the weighting process for the NHES:2007 RDD surveys can be found in Hagedorn et al. (2008).

In this section, the effect of the weighting adjustments on the NHES:2007 RDD sample estimates is evaluated. Tables 7-13, 7-14, and 7-15 provide estimates computed using weights at three different stages of weighting for the SR, PFI, and AEWR surveys, respectively. The first set of estimates uses unadjusted weights reflecting only the probabilities of selection. The second set of estimates is produced using weights adjusted for unit nonresponse to the Screener and the extended interview. The third set uses the final weights, reflecting all nonresponse and calibration adjustments. The estimates chosen for comparison include key outcome variables from the surveys as well as key demographics. In section 7.4, the same set of estimates is considered in the evaluation of bias in the published final RDD estimates compared to the final estimates from the Bias Study.

As shown in tables 7-13, 7-14, and 7-15, there are no substantive differences (i.e., differences of 5 percentage points or more) between the unadjusted estimates and the nonresponse adjusted estimates. Considered together with the results provided in chapter 8, this is an indication that there is little evidence of nonresponse bias in the NHES:2007 estimates.

There are some differences between the nonresponse adjusted estimates and final estimates. The differences indicate potential noncoverage bias prior to raking that was reduced through the raking process. For the SR survey (table 7-13), estimates after the raking adjustments are lower than the nonresponse adjusted estimates for the proportion of preschoolers who participate in center-based care, recognize all colors, count to 20 or higher, and write their first name; who have parents who believe it is essential to prepare their child for kindergarten by teaching them the alphabet and sharing; who have a family member that reads to them everyday in the past week; whose parents took three or more outings with them in the past month; who have household incomes above $50,000; and who have both a mother and father in the household. In addition, the final estimates are higher than the nonresponse adjusted estimates for the proportion of preschoolers who live in a home that is not owned, have parents with a high school diploma or below, are below the poverty threshold, have household incomes below $15,000, and have a mother only in the household. Many of the estimates that differ before and after the raking adjustments are related to the variables used in raking: race/ethnicity, household income, region, urbanicity, home tenure, age, and enrollment status.

For the PFI and AEWR surveys (tables 7-14 and 7-15, respectively), no substantive differences were found between the nonresponse adjusted estimates and final estimates for the key survey outcome variables. Results for the demographic variables are similar to those for the SR survey. For the PFI survey, the final estimates are higher than the nonresponse adjusted estimates for the proportion of children who live in a home that is not owned, are below the poverty threshold, and have household incomes below $15,000. The final estimates are lower than the nonresponse adjusted estimates for the proportion of children who have household incomes above $50,000 and who have both a mother and father in the household. Race/ethnicity, household income, region, urbanicity, home tenure, and grade were used in the raking adjustment for the PFI survey, and these characteristics are related to many of these demographic variables. For the AEWR survey, the final estimates are higher than the nonresponse adjusted estimates for the proportion of adults ages 24 years or younger, who do not own their home, and who never married. The final estimates are lower than the nonresponse adjusted estimates for the proportion of adults who are ages 55 years or older, who are currently married, and who have a household income above $50,000. Age, home tenure, and household income were among the variables used in the raking adjustment for the AEWR survey, and an indicator for single adults was used in the household-level poststratification adjustment. The differences found in this evaluation indicate the raking adjustments were effective in reducing noncoverage bias in these estimates.

Differences were found for the same set of characteristics when comparing the unadjusted estimates to the final estimates, with a few exceptions. The difference between the unadjusted estimate and final estimate of the proportion of adults who have a household income above $50,000 is not of

substantive importance, possibly indicating nonresponse bias and noncoverage bias in the unadjusted estimate that were acting in opposite directions. In addition, the final estimates are lower than the unadjusted estimates for the proportion of preschoolers who have parents who believe it is essential to prepare their child for kindergarten by teaching the child numbers. The final estimates are higher than the unadjusted estimates for the proportion of preschoolers who are age 3 and have a household income between $15,001 and $30,000, the proportion of children who have parents with a high school diploma or below and have a mother only in the household, and the proportion of adults ages 25 to 34. These differences indicate potential overall bias in these unadjusted estimates that was reduced through the nonresponse and raking adjustments.

The final, fully adjusted estimates from the NHES:2007 RDD sample were also compared with estimates from previous NHES collections, the CPS, and other relevant extant data sources, similar to the analysis in section 7.2. The results of these comparisons can be found in Hagedorn et al (2008). The comparisons indicated the estimates from the NHES:2007 RDD sample were reasonable, although some differences were found between the NHES:2007 and CPS estimates of household income, parents' highest level of education, and family structure.

7.4 An Examination of Overall Bias

In addition to the comparison of estimates to external sources, an assessment of overall bias can be done by comparing the published estimates from the RDD survey that use the final, fully adjusted weights to the estimates from the Bias Study under the full treatment (completed extended interviews from FT/RT and FTO cells of figure 4-1; see section 5.2 for an explanation of what is meant by full and reduced treatment). Because the Bias Study sample and data collection effort are designed to capture both telephone nonrespondents and nontelephone households, differences between estimates from the Bias Study and estimates from the RDD sample may be a reflection of either nonresponse or noncoverage bias, or both. This section examines these differences in estimates of characteristics of the target populations for the NHES:2007 surveys. The items included in these comparisons were selected because they include important demographic and socioeconomic characteristics of persons and households, or because they are key outcome variables from the surveys.

Table 7-13. Unadjusted, nonresponse adjusted, and final estimates for various characteristics from the School Readiness Survey: NHES:2007 RDD

Characteristic	Sample size	SR respondents with unadjusted weights		SR respondents with nonresponse adjusted weights		SR respondents with final weights	
		Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)	Standard error
Participation in center-based care	1,759	68.2	0.90	68.8	0.93	55.3	0.89
Specific skills							
Recognizes all colors	2,265	88.4	0.63	88.2	0.64	82.5	1.02
Counts to 20 or higher	1,747	69.4	1.09	69.6	1.11	63.2	1.30
Recognizes all letters	891	36.0	1.17	36.6	1.21	31.8	1.19
Writes first name	1,709	67.9	1.03	67.8	1.15	59.8	1.27
Holds a pencil	2,298	87.6	0.70	87.5	0.74	86.8	0.95
Speech is often understandable to a stranger	2,170	84.2	0.85	84.2	0.89	81.1	1.20
Reads or pretends to read storybooks	2,582	97.9	0.36	97.9	0.35	98.0	0.31
Parents believe it is essential to do certain things to prepare child for kindergarten							
Teach child the alphabet	1,582	62.4	0.97	62.2	1.05	56.3	1.25
Teach child about sharing	1,732	69.0	1.10	68.2	1.15	61.8	1.37
Teach child to read	1,226	47.2	1.11	47.6	1.20	45.0	1.36
Teach child numbers	1,507	59.2	1.12	59.0	1.19	54.1	1.37
Show child how to hold a pencil	1,104	43.5	1.29	43.7	1.37	40.9	1.37
Family member read to child everyday in the past week	1,575	62.2	0.96	61.7	1.02	55.3	0.97
Parents report usually doing certain reading-related activity with child							
Ask child what is in a picture	1,390	53.4	1.13	54.4	1.24	55.5	1.26
Stop reading and point out letters	818	30.6	1.15	31.3	1.30	31.1	1.46
Ask child to read with parent	589	22.1	0.89	22.9	1.02	23.6	1.26
Talk about the story and what happened	1,419	54.4	1.24	54.9	1.34	56.1	1.44

See notes at end of table.

Table 7-13. Unadjusted, nonresponse adjusted, and final estimates for various characteristics from the School Readiness Survey: NHES:2007 RDD—Continued

Characteristic	Sample size	SR respondents with unadjusted weights		SR respondents with nonresponse adjusted weights		SR respondents with final weights	
		Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)	Standard error
Parents did home activities with child in the past week[1]	1,088	42.3	1.20	41.5	1.34	37.7	1.20
Parents took 3 or more outings with child in the past month[2]	1,175	46.0	1.12	46.0	1.14	39.0	1.10
Child watches 2 or more hours of TV in a typical weekday	1,538	57.8	1.04	57.5	1.04	61.6	1.19
Child has a disability	453	17.2	0.89	17.4	0.93	17.6	1.00
Child's age							
3 years	1,098	37.8	1.04	38.2	1.14	43.0	1.24
4 years	1,159	45.5	1.19	45.6	1.31	42.8	1.41
5 years and older	376	16.7	0.98	16.2	0.99	14.2	0.89
Child's sex							
Male	1,279	50.1	1.00	50.0	1.02	50.3	1.16
Female	1,354	49.9	1.00	50.0	1.02	49.7	1.16
Household urbanicity							
Urban	2,217	80.8	1.01	81.9	1.02	79.9	0.43
Rural	416	19.2	1.01	18.1	1.02	20.1	0.43
Home tenure							
Own	1,945	77.4	0.85	75.1	0.81	61.3	0.47
Rent/other	688	22.6	0.85	24.9	0.81	38.7	0.47

See notes at end of table.

Table 7-13. Unadjusted, nonresponse adjusted, and final estimates for various characteristics from the School Readiness Survey: NHES:2007 RDD—Continued

Characteristic	Sample size	SR respondents with unadjusted weights		SR respondents with nonresponse adjusted weights		SR respondents with final weights	
		Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)	Standard error
Parents' educational attainment							
High school diploma or below	603	20.2	0.83	20.4	0.87	27.8	1.26
Beyond high school diploma	2,030	79.8	0.83	79.6	0.87	72.2	1.26
Parents' language							
Both/only parent(s) speak(s) English	2,218	87.7	0.65	86.8	0.73	84.9	0.79
One of two parents speaks English	45	1.4	0.23	1.5	0.26	1.5	0.30
No parent speaks English	370	11.0	0.61	11.7	0.68	13.6	0.77
Mothers' employment status							
35 hours or more per week	959	35.6	1.06	35.9	1.07	36.4	1.44
Less than 35 hours per week	597	23.9	0.87	23.6	0.90	20.9	0.94
Looking for work	108	3.6	0.36	3.5	0.37	5.5	0.70
Not in labor force	927	35.5	1.08	35.5	1.16	35.8	1.48
No mother in household	42	1.5	0.28	1.4	0.28	1.5	0.30
Poverty status							
Poor	412	13.3	0.66	13.5	0.71	22.5	0.81
Nonpoor	2,221	86.7	0.66	86.5	0.71	77.5	0.81
Household income							
Less than $15,000	251	7.7	0.52	7.9	0.55	14.5	0.93
$15,001 to $30,000	356	12.1	0.84	12.5	0.90	17.4	1.09
$30,001 to $50,000	446	16.6	0.88	16.5	0.85	17.1	0.82
More than $50,000	1,580	63.6	1.03	63.0	1.01	51.0	0.82

See notes at end of table.

Table 7-13. Unadjusted, nonresponse adjusted, and final estimates for various characteristics from the School Readiness Survey: NHES:2007 RDD—Continued

Characteristic	Sample size	SR respondents with unadjusted weights		SR respondents with nonresponse adjusted weights		SR respondents with final weights	
		Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)	Standard error
Family structure							
Mother and father	2,192	85.6	0.73	85.3	0.79	78.7	0.96
Mother	346	11.2	0.63	11.7	0.70	17.2	0.92
Father	40	1.4	0.25	1.3	0.23	1.4	0.28
Nonparent guardian(s)	55	1.7	0.27	1.7	0.30	2.6	0.54

[1] Told child a story; taught child letters, words, or numbers; taught child songs or music; did arts and crafts with child; played sports, active games or exercised together; and played board games or did puzzles with child.
[2] Any three or more of the following: Visited a library; visited a bookstore; went to a play, concert, or other live show; visited an art gallery, museum, or historical site; visited a zoo or aquarium; attended an event sponsored by a community, religious, or ethnic group; and attended an athletic or sporting event (outside of school) in which the child was not a player.
NOTE: Shading indicates a significant difference of 5 percentage points or more between the unadjusted and final estimate.
SOURCE: U.S. Department of Education, National Center for Education Statistics, School Readiness (SR) Survey of the National Household Education Surveys Program, 2007.

Table 7-14. Unadjusted, nonresponse adjusted, and final estimates for various characteristics from the Parent and Family Involvement Survey: NHES:2007 RDD

Characteristic	Sample size	PFI respondents with unadjusted weights		PFI respondents with nonresponse adjusted weights		PFI respondents with final weights	
		Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)	Standard error
Parents participate in 5 or more activities in the student's school[1]	5,576	55.1	0.59	55.4	0.60	53.0	0.62
Parents report school provides information very well							
About how student is doing in school	6,385	61.7	0.60	61.7	0.65	60.9	0.76
About how to help student with his/her homework	4,740	45.6	0.57	46.2	0.59	46.6	0.65
About why student is placed in particular groups or classes	4,481	43.7	0.55	44.0	0.58	44.5	0.65
About how to help student plan for college or vocational school	2,064	33.4	0.74	33.7	0.79	34.0	0.86
About the family's expected role at student's school	5,024	48.4	0.60	48.9	0.64	48.4	0.72
Parent reports being very satisfied with 4 or more aspects of the student's school[2]	7,263	70.3	0.54	70.3	0.56	69.8	0.62
Parents participated in 5 or more home learning activities[3]	2,213	46.4	0.87	46.7	0.94	47.0	1.02
Parents took 3 or more outings with student in the past month[4]	5,321	51.1	0.67	51.5	0.72	49.5	0.77
Parents check to see that student's homework gets done	8,190	83.7	0.49	84.3	0.53	85.4	0.46
Parents received information about free tutoring	4,552	42.5	0.58	42.9	0.62	43.9	0.65

See notes at end of table.

Table 7-14. Unadjusted, nonresponse adjusted, and final estimates for various characteristics from the Parent and Family Involvement Survey: NHES:2007 RDD—Continued

Characteristic	Sample size	PFI respondents with unadjusted weights		PFI respondents with nonresponse adjusted weights		PFI respondents with final weights	
		Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)	Standard error
Parent expects student to earn a college degree or higher	4,360	72.4	0.87	72.4	0.93	69.6	1.02
Family plans to help pay for student's education after high school	4,700	83.6	0.68	83.3	0.73	81.3	0.84
Student participated in school activities	5,965	59.0	0.66	58.0	0.72	56.0	0.76
Student has a disability	2,463	23.2	0.58	22.8	0.61	23.9	0.68
Student's sex							
Male	5,498	51.8	0.60	51.6	0.64	51.8	0.74
Female	5,183	48.2	0.60	48.4	0.64	48.2	0.74
Home tenure							
Own	8,438	81.3	0.49	78.9	0.46	70.0	0.24
Rent/other	2,243	18.7	0.49	21.1	0.46	30.0	0.24
Parents' educational attainment							
High school diploma or below	2,578	22.7	0.53	23.3	0.52	27.8	0.56
Beyond high school diploma	8,103	77.3	0.53	76.7	0.52	72.2	0.56
Parents' language							
Both/only parent(s) speak(s) English	9,437	90.5	0.31	89.6	0.33	88.5	0.34
One of two parents speaks English	159	1.2	0.12	1.3	0.13	1.4	0.16
No parent speaks English	1,085	8.3	0.30	9.1	0.30	10.2	0.32

See notes at end of table.

Table 7-14. Unadjusted, nonresponse adjusted, and final estimates for various characteristics from the Parent and Family Involvement Survey: NHES:2007 RDD—Continued

Characteristic	Sample size	PFI respondents with unadjusted weights		PFI respondents with nonresponse adjusted weights		PFI respondents with final weights	
		Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)	Standard error
Mothers' employment status							
35 hours or more per week	4,993	44.7	0.60	45.2	0.67	44.2	0.66
Less than 35 hours per week	2,290	23.9	0.47	23.4	0.48	21.8	0.44
Looking for work	393	3.4	0.19	3.4	0.21	4.6	0.33
Not in labor force	2,611	24.9	0.53	24.8	0.57	26.1	0.59
No mother in household	394	3.2	0.18	3.2	0.19	3.3	0.21
Poverty status							
Poor	1,291	11.7	0.37	12.4	0.42	19.2	0.33
Nonpoor	9,390	88.3	0.37	87.6	0.42	80.8	0.33
Household income							
Less than $15,000	824	6.6	0.32	6.9	0.35	12.2	0.32
$15,001 to $30,000	1,321	11.4	0.38	12.1	0.43	15.0	0.40
$30,001 to $50,000	1,799	16.3	0.46	16.6	0.47	16.4	0.45
More than $50,000	6,737	65.7	0.54	64.4	0.56	56.4	0.46
Family structure							
Mother and father	7,995	79.1	0.45	78.0	0.50	72.7	0.54
Mother	1,876	14.8	0.40	15.8	0.44	20.0	0.55
Father	356	2.9	0.18	2.9	0.19	3.0	0.21
Nonparent guardian(s)	454	3.3	0.21	3.3	0.25	4.3	0.39
School type							
Public	8,978	86.9	0.40	86.8	0.45	88.2	0.45
Private	1,392	13.1	0.40	13.2	0.45	11.8	0.45

See notes at end of table.

Table 7-14. Unadjusted, nonresponse adjusted, and final estimates for various characteristics from the Parent and Family Involvement Survey: NHES:2007 RDD—Continued

Characteristic	Sample size	PFI respondents with unadjusted weights		PFI respondents with nonresponse adjusted weights		PFI respondents with final weights	
		Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)	Standard error
School size							
Under 300	1,480	15.5	0.47	14.9	0.51	14.9	0.57
300-599	3,142	31.3	0.62	30.9	0.62	31.3	0.69
600-999	2,756	27.0	0.57	27.4	0.58	26.7	0.60
1,000 or more	2,910	26.1	0.56	26.7	0.56	27.0	0.52

[1] Any 5 or more of the following: Attended a general school meeting; attended a meeting of the parent-teacher organization or association; went to a regularly scheduled parent-teacher conference with the student's teacher; attended a school or class event because of the student; served as a volunteer in the student's classroom or elsewhere in the school; participated in fundraising for the school; served on a school committee; and met with a guidance counselor in person.

[2] Any 4 or more of the following: School student attends this year; teachers student has this year; academic standards of the school; order and discipline at the school; and way that school staff interact with parents.

[3] Any 5 or more of the following: Told student a story; did arts and crafts with student; played sports, active games or exercised together; worked on projects such as building, making, or fixing something with student not as a chore; talked with student about family history or ethnic heritage; and played board games or did puzzles with student.

[4] Any 3 or more of the following: Visited a library; visited a bookstore; went to a play, concert, or other live show; visited an art gallery, museum, or historical site; visited a zoo or aquarium; attended an event sponsored by a community, religious, or ethnic group; and attended an athletic or sporting event (outside of school) in which the child was not a player.

NOTE: Shading indicates a significant difference of 5 percentage points or more between the unadjusted and final estimate.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education (PFI) Survey of the National Household Education Surveys Program, 2007.

Table 7-15. Unadjusted, nonresponse adjusted, and final estimates for various characteristics from the Adult Education for Work-Related Reasons Survey: NHES:2007 RDD

Characteristic	Sample size	AEWR respondents with unadjusted weights		AEWR respondents with nonresponse adjusted weights		AEWR respondents with final weights	
		Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)	Standard error
Participates in adult education for work related reasons	3,356	36.0	0.68	37.0	0.73	37.6	0.95
Participates in employer-supported AEWR	2,379	74.2	0.91	75.2	1.14	73.2	1.58
Participates in distance education	1,964	56.2	1.21	56.5	1.33	54.4	1.67
Participates in program to earn a college or university degree	694	7.0	0.31	7.6	0.38	9.7	0.55
Participates in program to earn a vocational or technical diploma	383	3.7	0.25	3.7	0.31	4.1	0.38
Participates in formal apprenticeship program	79	0.9	0.12	1.0	0.14	1.4	0.25
Participates in work-related training or courses	2,899	31.5	0.70	32.2	0.73	31.2	0.90
Participates in 4 or more informal work related learning activities[1]	2,334	27.5	0.68	28.6	0.83	27.6	1.07
Has any condition that limits ability to work	1,190	14.1	0.47	12.9	0.50	13.5	0.68

See notes at end of table.

Table 7-15. Unadjusted, nonresponse adjusted, and final estimates for various characteristics from the Adult Education for Work-Related Reasons Survey: NHES:2007 RDD—Continued

Characteristic	Sample size	AEWR respondents with unadjusted weights		AEWR respondents with nonresponse adjusted weights		AEWR respondents with final weights	
		Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)	Standard error
Age							
16 to 24 years	438	5.8	0.33	6.7	0.41	12.1	0.70
25 to 34 years	738	10.4	0.61	12.0	0.77	16.4	0.92
35 to 44 years	1,091	17.8	0.66	19.9	0.94	19.4	0.81
45 to 54 years	1,595	22.8	0.76	23.0	0.83	20.6	0.83
55 years and older	3,848	43.2	0.79	38.4	0.90	31.6	0.41
Home tenure							
Own	6,289	83.7	0.62	83.4	0.73	70.3	0.34
Rent/other	1,421	16.3	0.62	16.6	0.73	29.7	0.34
Marital status							
Never married	1,320	13.5	0.49	14.0	0.55	22.3	0.80
Currently married	4,329	68.1	0.69	70.4	0.75	61.5	0.86
Other	2,061	18.4	0.58	15.6	0.58	16.2	0.58
Household income							
Less than $15,000	838	9.4	0.42	8.7	0.47	11.1	0.35
$15,001 to $30,000	1,182	14.4	0.56	13.0	0.63	15.0	0.57
$30,001 to $50,000	1,495	18.7	0.65	18.5	0.70	20.9	0.92
More than $50,000	4,195	57.5	0.80	59.8	0.90	53.0	0.90
Language spoken most at home							
English	7,277	93.7	0.45	92.6	0.58	90.1	0.63
Spanish	244	3.6	0.35	4.3	0.45	6.0	0.48
Other language	136	2.0	0.27	2.2	0.31	2.3	0.30
English and Spanish equally	52	0.7	0.12	0.9	0.23	1.6	0.63
English and other language equally	‡	‡	‡	‡	‡	‡	‡

See notes at end of table.

Table 7-15. Unadjusted, nonresponse adjusted, and final estimates for various characteristics from the Adult Education for Work-Related Reasons Survey: NHES:2007 RDD—Continued

Characteristic	Sample size	AEWR respondents with unadjusted weights: Estimate (percent)	AEWR respondents with unadjusted weights: Standard error	AEWR respondents with nonresponse adjusted weights: Estimate (percent)	AEWR respondents with nonresponse adjusted weights: Standard error	AEWR respondents with final weights: Estimate (percent)	AEWR respondents with final weights: Standard error
Employment status							
Employed	4,311	56.3	0.85	58.4	1.00	58.2	1.09
Unemployed but looking for work	250	3.5	0.41	3.7	0.50	5.7	0.76
Not in the labor force	3,149	40.2	0.79	37.9	0.95	36.1	1.04

‡ Reporting standards not met.

[1] Any 4 or more of the following: Received on-the-job demonstrations of equipment, techniques, or procedures by a supervisor or coworker; received other supervised training or mentoring on the job; self-paced study using books, procedures manuals, audio tapes, or videos; self-paced study using computer-based software tutorials; attended "brown-bag" or informal presentations; attended conferences, trade shows, or conventions related to the adult's work or profession; and read professional journals, trade publications, or work-related magazines.

NOTE: Shading indicates a significant difference of 5 percentage points or more between the unadjusted and final estimate.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education for Work-Related Reasons Survey of the National Household Education Surveys Program, 2007.

Table 7-16 contains estimates from the RDD sample and the Bias Study sample of various characteristics from the SR Survey. The Bias Study sample yielded larger estimates of the percentage of preschoolers who can count to 20 or higher and the percentage of preschoolers whose speech is often understandable to a stranger. Additionally, the Bias Study estimate of the percentage of preschoolers who watch two or more hours of television in a typical weekday is higher. Although there are some differences in estimates between the two samples, it is likely that these differences were found mainly as a result of having examined so many characteristics.[42] There is no systematic relationship among these differences that would be indicative of bias.

There is a difference in the estimates of the percentage of preschoolers whose mothers are not in the labor force (36 percent from the RDD sample versus 26 percent from the Bias Study sample). This difference may be an indication of accessibility, with mothers who are not in the labor force being more available and more willing to complete the interview by telephone than mothers with other employment status. One other curious difference is in the sex distribution of preschoolers; the Bias Study sample estimated 62 percent of preschoolers to be male, compared to 50 percent for the RDD sample and 52 percent for the CPS sample in October 2005; the reason for this difference is unclear.[43]

In table 7-17, estimates from the RDD sample and the Bias Study sample of characteristics from the PFI Survey are compared. There are no significant differences of 5 percentage points or more. However, there are some smaller differences of statistical significance. For instance, the estimated percentage of parents who report the school provides information very well about how to help the student plan for college or vocational school is 34 percent for the RDD sample, which is 13 percent lower than the Bias Study estimate. In addition, the estimated percentage of students in schools of size 1,000 or more is 12 percent lower for the RDD sample than the Bias Study sample (27 percent versus 31 percent).

[42] Another possible explanation for the differences is the later data collection for the field portion of the Bias Study sample. However, the mean and median age-in-months at the time of interview of preschoolers in the RDD sample were compared to that for the Bias Study sample, and no significant differences were found. While the Bias Study preschoolers may have had more months of preschool/daycare, this can not be tested, and therefore there is not evidence to attribute the differences to the data collection schedules.

[43] The skewed sex distribution for the Bias Study sample is also evident before weighting adjustments (see Appendix G) and for the reduced effort (see chapter 8). To evaluate the effect of the skewed sex distribution on the analysis of overall bias, the Bias Study weights were re-raked, including sex as an additional raking dimension. The analysis in Table 7-16 was then reproduced with the new weights. The conclusions remained the same, with a few exceptions. First, the difference between the RDD sample and Bias Study sample estimates of the percentage of preschoolers who can count to 20 or higher was no longer of substantive importance after re-raking. The estimated bias was -5.2 percentage points before re-raking and -4.8 percentage points after. Second, the difference in the percentage of preschoolers of age 4 years was statistically significant after re-raking. The estimated bias was 5.5 percentage points (not significant) before re-raking and 6.7 percentage points after. Finally, the difference in the percentage of preschoolers whose mother was looking for work increased from -4.5 percentage points (not of substantive importance) before re-raking to a statistically significant and substantive difference of -5.5 percentage points after.

Table 7-16. Estimates of overall bias for various characteristics from the School Readiness Survey: NHES:2007 RDD and NHES:2007 Bias Study

Characteristic	All RDD sample SR respondents			All Bias Study sample SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Participation in center-based care	1,759	55.3	0.89	177	51.1	2.29	4.2	2.46	8.2
Specific skills									
Recognizes all colors	2,265	82.5	1.02	249	85.6	2.34	-3.1	2.55	-3.6
Counts to 20 or higher	1,747	63.2	1.30	198	68.4	2.27	-5.2	2.61	-7.6
Recognizes all letters	891	31.8	1.19	93	29.4	2.89	2.4	3.12	8.2
Writes first name	1,709	59.8	1.27	193	60.4	3.08	-0.6	3.33	-0.9
Holds a pencil	2,298	86.8	0.95	252	86.7	1.90	#	2.12	0.1
Speech is often understandable to a stranger	2,170	81.1	1.20	249	87.3	2.17	-6.2	2.48	-7.1
Reads or pretends to read storybooks	2,582	98.0	0.31	289	99.2	0.45	-1.2	0.55	-1.2
Parents believe it is essential to do certain things to prepare child for kindergarten									
Teach child the alphabet	1,582	56.3	1.25	171	57.7	2.72	-1.4	2.99	-2.5
Teach child about sharing	1,732	61.8	1.37	177	57.8	2.97	4.0	3.27	6.9
Teach child to read	1,226	45.0	1.36	139	48.0	3.47	-3.0	3.73	-6.3
Teach child numbers	1,507	54.1	1.37	155	51.7	2.64	2.4	2.98	4.6
Show child how to hold a pencil	1,104	40.9	1.37	121	37.9	2.88	3.0	3.19	8.0
Family member read to child everyday in the past week	1,575	55.3	0.97	169	56.9	4.02	-1.6	4.14	-2.8

See notes at end of table.

Table 7-16. Estimates of overall bias for various characteristics from the School Readiness Survey: NHES:2007 RDD and NHES:2007 Bias Study—Continued

Characteristic	All RDD sample SR respondents			All Bias Study sample SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents report usually doing certain reading-related activity with child									
Ask child what is in a picture	1,390	55.5	1.26	159	52.9	4.00	2.6	4.20	4.9
Stop reading and point out letters	818	31.1	1.46	95	31.9	4.14	-0.8	4.39	-2.6
Ask child to read with parent	589	23.6	1.26	84	29.7	3.05	-6.1	3.30	-20.6
Talk about the story and what happened	1,419	56.1	1.44	165	60.3	3.18	-4.3	3.49	-7.0
Parents did home activities with child in the past week[3]	1,088	37.7	1.20	123	41.7	3.23	-4.0	3.45	-9.5
Parents took 3 or more outings with child in the past month[4]	1,175	39.0	1.10	138	46.0	3.71	-7.0	3.87	-15.3
Child watches 2 or more hours of TV in a typical weekday	1,538	61.6	1.19	179	71.1	2.10	-9.5	2.41	-13.3
Child has a disability	453	17.6	1.00	37	14.1	3.34	3.5	3.49	24.8
Child's age									
3 years	1,098	43.0	1.24	128	43.9	2.86	-0.9	3.12	-2.1
4 years	1,159	42.8	1.41	116	37.3	2.64	5.5	2.99	14.8
5 years and older	376	14.2	0.89	48	18.8	3.08	-4.6	3.20	-24.4

See notes at end of table.

Table 7-16. Estimates of overall bias for various characteristics from the School Readiness Survey: NHES:2007 RDD and NHES:2007 Bias Study—Continued

Characteristic	All RDD sample SR respondents			All Bias Study sample SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Child's sex									
Male	1,279	50.3	1.16	169	62.3	2.97	-12.0	3.19	-19.3
Female	1,354	49.7	1.16	123	37.7	2.97	12.0	3.19	31.9
Household urbanicity									
Urban	2,217	79.9	0.43	247	80.8	1.62	-0.9	1.67	-1.2
Rural	416	20.1	0.43	45	19.2	1.62	0.9	1.67	4.9
Home tenure									
Own	1,945	61.3	0.47	201	62.1	0.87	-0.8	0.99	-1.3
Rent/other	688	38.7	0.47	91	37.9	0.87	0.8	0.99	2.1
Parents' educational attainment									
High school diploma or below	603	27.8	1.26	91	34.5	3.80	-6.7	4.00	-19.5
Beyond high school diploma	2,030	72.2	1.26	201	65.5	3.80	6.7	4.00	10.3
Parents' language									
Both/only parent(s) speak(s) English	2,218	84.9	0.79	254	88.0	2.48	-3.1	2.60	-3.5
One of two parents speaks English	45	1.5	0.30	‡	‡	‡	0.5	0.78	50.0
No parent speaks English	370	13.6	0.77	29	11.0	2.60	2.6	2.71	23.9

See notes at end of table.

Table 7-16. Estimates of overall bias for various characteristics from the School Readiness Survey: NHES:2007 RDD and NHES:2007 Bias Study—Continued

Characteristic	All RDD sample SR respondents			All Bias Study sample SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Mothers' employment status									
35 hours or more per week	959	36.4	1.44	111	41.6	3.34	-5.2	3.64	-12.6
Less than 35 hours per week	597	20.9	0.94	69	20.4	3.21	0.5	3.35	2.3
Looking for work	108	5.5	0.70	23	10.0	2.49	-4.5	2.59	-44.7
Not in labor force	927	35.8	1.48	83	26.1	2.65	9.7	3.04	37.2
No mother in household	42	1.5	0.30	6!	1.9!	1.18!	-0.4	1.21	-20.2
Poverty status									
Poor	412	22.5	0.81	80	24.5	2.19	-2.0	2.34	-8.1
Nonpoor	2,221	77.5	0.81	212	75.5	2.19	2.0	2.34	2.6
Household income									
Less than $15,000	251	14.5	0.93	52	15.3	1.71	-0.8	1.94	-5.3
$15,001 to $30,000	356	17.4	1.09	62	17.6	2.39	-0.2	2.63	-0.9
$30,001 to $50,000	446	17.1	0.82	50	17.6	2.77	-0.5	2.89	-2.9
More than $50,000	1,580	51.0	0.82	128	49.5	2.92	1.5	3.03	3.0

See notes at end of table.

Table 7-16. Estimates of overall bias for various characteristics from the School Readiness Survey: NHES:2007 RDD and NHES:2007 Bias Study —Continued

Characteristic	All RDD sample SR respondents			All Bias Study sample SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Family structure									
Mother and father	2,192	78.7	0.96	219	73.4	4.36	5.3	4.46	7.2
Mother	346	17.2	0.92	60	22.4	3.09	-5.2	3.23	-23.1
Father	40	1.4	0.28	6!	1.9!	1.18!	-0.5	1.21	-25.5
Nonparent guardian(s)	55	2.6	0.54	7	2.3	0.96	0.3	1.10	11.6

Rounds to zero.
! Interpret with caution.
‡ Reporting standards not met.
[1] Bias is estimated as the difference between the "all RDD sample SR respondents" estimate and the "all Bias Study sample SR respondents" estimate.
[2] Relative bias is estimated as the bias estimate divided by the "all Bias Study sample SR respondents" estimate, and is expressed as a percentage.
[3] Told child a story; taught child letters, words, or numbers; taught child songs or music; did arts and crafts with child; played sports, active games or exercised together; and played board games or did puzzles with child.
[4] Any three or more of the following: Visited a library; visited a bookstore; went to a play, concert, or other live show; visited an art gallery, museum, or historical site; visited a zoo or aquarium; attended an event sponsored by a community, religious, or ethnic group; and attended an athletic or sporting event (outside of school) in which the child was not a player.
NOTE: Shading indicates a significant difference of 5 percentage points or more.
SOURCE: U.S. Department of Education, National Center for Education Statistics, School Readiness (SR) Survey of the National Household Education Surveys Program, 2007.

Table 7-17. Estimates of overall bias for various characteristics from the Parent and Family Involvement Survey: NHES:2007 RDD and NHES:2007 Bias Study

Characteristic	All RDD sample PFI respondents			All Bias Study sample PFI respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents participate in 5 or more activities in the student's school[3]	5,576	53.0	0.62	566	52.1	2.22	0.9	2.30	1.7
Parents report school provides information very well									
About how student is doing in school	6,385	60.9	0.76	668	58.2	2.20	2.7	2.33	4.6
About how to help student with his/her homework	4,740	46.6	0.65	525	47.9	2.07	-1.3	2.17	-2.7
About why student is placed in particular groups or classes	4,481	44.5	0.65	496	45.6	1.67	-1.1	1.79	-2.4
About how to help student plan for college or vocational school	2,064	34.0	0.86	237	38.9	1.65	-4.9	1.86	-12.6
About the family's expected role at student's school	5,024	48.4	0.72	539	46.9	1.93	1.5	2.06	3.2
Parent reports being very satisfied with 4 or more aspects of the student's school[4]	7,263	69.8	0.62	798	73.7	1.87	-3.9	1.97	-5.3
Parents participated in 5 or more home learning activities[5]	2,213	47.0	1.02	229	42.2	2.28	4.8	2.50	11.4

See notes at end of table.

Table 7-17. Estimates of overall bias for various characteristics from the Parent and Family Involvement Survey: NHES:2007 RDD and NHES:2007 Bias Study—Continued

Characteristic	All RDD sample PFI respondents			All Bias Study sample PFI respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents took 3 or more outings with student in the past month[6]	5,321	49.5	0.77	559	50.3	2.09	-0.8	2.23	-1.6
Parents check to see that student's homework gets done	8,190	85.4	0.46	885	87.9	0.99	-2.5	1.09	-2.8
Parents received information about free tutoring	4,552	43.9	0.65	465	42.6	2.15	1.3	2.25	3.1
Parent expects student to earn a college degree or higher	4,360	69.6	1.02	424	67.2	2.87	2.4	3.05	3.6
Family plans to help pay for student's education after high school	4,700	81.3	0.84	475	83.1	2.19	-1.8	2.35	-2.2
Student participated in school activities	5,965	56.0	0.76	624	55.8	1.89	0.2	2.04	0.4
Student has a disability	2,463	23.9	0.68	257	23.0	2.16	0.9	2.26	3.9
Student's sex									
Male	5,498	51.8	0.74	575	51.8	2.10	#	2.23	#
Female	5,183	48.2	0.74	548	48.2	2.10	#	2.23	#
Home tenure									
Own	8,438	70.0	0.24	837	69.7	0.80	0.3	0.84	0.4
Rent/other	2,243	30.0	0.24	286	30.3	0.80	-0.3	0.84	-1.0

See notes at end of table.

Table 7-17. Estimates of overall bias for various characteristics from the Parent and Family Involvement Survey: NHES:2007 RDD and NHES:2007 Bias Study—Continued

Characteristic	All RDD sample PFI respondents			All Bias Study sample PFI respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents' educational attainment									
High school diploma or below	2,578	27.8	0.56	326	31.7	2.31	-3.9	2.38	-12.3
Beyond high school diploma	8,103	72.2	0.56	797	68.3	2.31	3.9	2.38	5.7
Parents' language									
Both/only parent(s) speak(s) English	9,437	88.5	0.34	1012	90.9	1.29	-2.4	1.33	-2.6
One of two parents speaks English	159	1.4	0.16	22	2.1	0.61	-0.7	0.63	-33.3
No parent speaks English	1,085	10.2	0.32	66	7.0	1.17	3.2	1.21	45.7
Mothers' employment status									
35 hours or more per week	4,993	44.2	0.66	521	47.0	2.12	-2.8	2.22	-6.0
Less than 35 hours per week	2,290	21.8	0.44	260	21.1	1.68	0.7	1.74	3.3
Looking for work	393	4.6	0.33	45	4.1	0.56	0.5	0.65	12.2
Not in labor force	2,611	26.1	0.59	241	23.4	1.24	2.7	1.37	11.5
No mother in household	394	3.3	0.21	56	4.4	0.55	-1.1	0.59	-25.0
Poverty status									
Poor	1,291	19.2	0.33	221	19.7	1.05	-0.5	1.10	-2.5
Nonpoor	9,390	80.8	0.33	902	80.3	1.05	0.5	1.10	0.6
Household income									
Less than $15,000	824	12.2	0.32	153	12.9	0.64	-0.7	0.72	-5.4
$15,001 to $30,000	1,321	15.0	0.40	179	15.2	1.22	-0.2	1.28	-1.3
$30,001 to $50,000	1,799	16.4	0.45	171	16.6	2.23	-0.2	2.27	-1.2
More than $50,000	6,737	56.4	0.46	620	55.3	2.22	1.1	2.27	2.0

See notes at end of table.

Table 7-17. Estimates of overall bias for various characteristics from the Parent and Family Involvement Survey: NHES:2007 RDD and NHES:2007 Bias Study—Continued

Characteristic	All RDD sample PFI respondents			All Bias Study sample PFI respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Family structure									
Mother and father	7,995	72.7	0.54	823	74.1	1.88	-1.4	1.96	-1.9
Mother	1,876	20.0	0.55	204	18.6	1.61	1.4	1.70	7.5
Father	356	3.0	0.21	54	4.0	0.42	-1.0	0.47	-25.0
Nonparent guardian(s)	454	4.3	0.39	42	3.3	0.55	1.0	0.67	30.3
School type									
Public	8,978	88.2	0.45	989	89.9	1.65	-1.7	1.71	-1.9
Private	1,392	11.8	0.45	114	10.1	1.65	1.7	1.71	16.8
School size									
Under 300	1,480	14.9	0.57	167	14.6	1.51	0.3	1.61	2.1
300-599	3,142	31.3	0.69	321	28.8	2.59	2.5	2.68	8.7
600-999	2,756	26.7	0.60	286	25.8	1.81	0.9	1.91	3.5
1,000 or more	2,910	27.0	0.52	323	30.8	1.65	-3.8	1.73	-12.3

Rounds to zero.

[1] Bias is estimated as the difference between the "all RDD sample PFI respondents" estimate and the "all Bias Study sample PFI respondents" estimate.

[2] Relative bias is estimated as the bias estimate divided by the "all Bias Study sample PFI respondents" estimate, and is expressed as a percentage.

[3] Any 5 or more of the following: Attended a general school meeting; attended a meeting of the parent-teacher organization or association; went to a regularly scheduled parent-teacher conference with the student's teacher; attended a school or class event because of the student; served as a volunteer in the student's classroom or elsewhere in the school; participated in fundraising for the school; served on a school committee; and met with a guidance counselor in person.

[4] Any 4 or more of the following: School student attends this year; teachers student has this year; academic standards of the school; order and discipline at the school; and way that school staff interact with parents.

[5] Any 5 or more of the following: Told student a story; did arts and crafts with student; played sports, active games or exercised together; worked on projects such as building, making, or fixing something with student not as a chore; talked with student about family history or ethnic heritage; and played board games or did puzzles with student.

[6] Any 3 or more of the following: Visited a library; visited a bookstore; went to a play, concert, or other live show; visited an art gallery, museum, or historical site; visited a zoo or aquarium; attended an event sponsored by a community, religious, or ethnic group; and attended an athletic or sporting event (outside of school) in which the child was not a player.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education (PFI) Survey of the National Household Education Surveys Program, 2007.

Table 7-18 contains a comparison of estimates from the RDD and Bias Study samples of characteristics from the AEWR Survey. There are differences in the marital status estimates, with the RDD sample yielding a higher estimate (62 percent) of currently married adults than the Bias Study sample (56 percent). With an estimate of 56 percent from the March 2006 Current Population Survey (CPS),[44] it is likely that the bias is in the RDD estimate, and that this may be indicative of the relative inaccessibility and undercoverage of unmarried adults.

[44] Based on independent tabulations of the March 2006 CPS data.

Table 7-18. Estimates of overall bias for various characteristics from the Adult Education for Work-Related Reasons Survey: NHES:2007 RDD and NHES:2007 Bias Study

Characteristic	All RDD sample AEWR respondents			All Bias Study sample AEWR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Participates in adult education for work-related reasons	3,356	37.6	0.95	495	39.1	1.76	-1.5	2.00	-3.8
Participates in employer-supported AEWR	2,379	73.2	1.58	347	70.0	3.57	3.2	3.90	4.6
Participates in distance education	1,964	54.4	1.67	285	60.1	2.98	-5.7	3.41	-9.4
Participates in program to earn a college or university degree	694	9.7	0.55	124	9.4	0.81	0.3	0.98	3.0
Participates in program to earn a vocational or technical diploma	383	4.1	0.38	56	4.2	0.70	-0.1	0.80	-1.9
Participates in formal apprenticeship program	79	1.4	0.25	5!	0.5!	0.33!	0.9	0.42	197.9
Participates in work-related training or courses	2,899	31.2	0.90	416	33.2	1.49	-2.0	1.74	-6.0
Participates in 4 or more informal work-related learning activities[3]	2,334	27.6	1.07	324	29.2	2.25	-1.6	2.49	-5.4
Has any condition that limits ability to work	1,190	13.5	0.68	153	15.2	2.63	-1.7	2.71	-11.2

See notes at end of table.

Table 7-18. Estimates of overall bias for various characteristics from the Adult Education for Work-Related Reasons Survey: NHES:2007 RDD and NHES:2007 Bias Study—Continued

Characteristic	All RDD sample AEWR respondents			All Bias Study sample AEWR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Age									
16 to 24 years	438	12.1	0.70	104	13.1	1.17	-1.0	1.36	-7.8
25 to 34 years	738	16.4	0.92	168	17.5	1.86	-1.1	2.08	-6.3
35 to 44 years	1,091	19.4	0.81	131	16.9	1.31	2.5	1.54	14.8
45 to 54 years	1,595	20.6	0.83	217	21.4	1.75	-0.8	1.94	-3.6
55 years and older	3,848	31.6	0.41	445	31.1	1.20	0.5	1.27	1.6
Home tenure									
Own	6,289	70.3	0.34	794	70.1	0.79	0.2	0.86	0.3
Rent/other	1,421	29.7	0.34	271	29.9	0.79	-0.2	0.86	-0.8
Marital status									
Never married	1,320	22.3	0.80	249	24.2	1.42	-1.9	1.63	-7.7
Currently married	4,329	61.5	0.86	531	55.9	2.06	5.6	2.23	10.1
Other	2,061	16.2	0.58	285	20.0	1.69	-3.8	1.79	-18.9
Household income									
Less than $15,000	838	11.1	0.35	194	10.6	0.54	0.5	0.64	4.5
$15,001 to $30,000	1,182	15.0	0.57	212	16.1	1.24	-1.1	1.36	-6.7
$30,001 to $50,000	1,495	20.9	0.92	188	23.1	1.59	-2.2	1.84	-9.3
More than $50,000	4,195	53.0	0.90	471	50.3	1.30	2.8	1.58	5.5

See notes at end of table.

Table 7-18. Estimates of overall bias for various characteristics from the Adult Education for Work-Related Reasons Survey: NHES:2007 RDD and NHES:2007 Bias Study—Continued

Characteristic	All RDD sample AEWR respondents			All Bias Study sample AEWR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Language spoken most at home									
English	7,277	90.1	0.63	999	92.4	1.60	-2.3	1.72	-2.5
Spanish	244	6.0	0.48	39	4.7	1.08	1.3	1.19	26.3
Other language	136	2.3	0.30	18	2.1	0.89	0.2	0.94	9.0
English and Spanish equally	52	1.6	0.63	8	0.7	0.31	0.9	0.70	142.4
English and other language equally	‡	‡	‡	‡	‡	‡	‡	‡	‡
Employment status									
Employed	4,311	58.2	1.09	627	61.2	1.93	-3.0	2.21	-4.8
Unemployed but looking for work	250	5.7	0.76	44	5.0	1.28	0.7	1.49	13.1
Not in the labor force	3,149	36.1	1.04	394	33.8	1.35	2.3	1.70	6.8

! Interpret with caution.
‡ Reporting standards not met.
[1] Bias is estimated as the difference between the "all RDD sample AEWR respondents" estimate and the "all Bias Study sample AEWR respondents" estimate.
[2] Relative bias is estimated as the bias estimate divided by the "all Bias Study sample AEWR respondents" estimate, and is expressed as a percentage.
[3] Any 4 or more of the following: Received on-the-job demonstrations of equipment, techniques, or procedures by a supervisor or coworker; received other supervised training or mentoring on the job; self-paced study using books, procedures manuals, audio tapes, or videos; self-paced study using computer-based software tutorials; attended "brown-bag" or informal presentations; attended conferences, trade shows, or conventions related to the adult's work or profession; and read professional journals, trade publications, or work-related magazines.
NOTE: Shading indicates a significant difference of 5 percentage points or more.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education for Work-Related Reasons Survey of the National Household Education Surveys Program, 2007.

8. COMPONENTS OF BIAS

Chapter 7 discussed an examination of overall bias in estimates from the NHES:2007 surveys. In this chapter, we examine separately the two major potential components of bias, nonresponse bias and noncoverage bias. As discussed in chapter 1, nonresponse bias occurs when sampled units fail to respond to the survey request and those units differ in some systematic fashion from those that do respond. Noncoverage bias occurs when units that are not included on the sampling frame differ in a systematic way from units that are included on the sampling frame. Section 8.1 examines nonresponse bias in estimates from the NHES:2007 surveys, and section 8.2 contains an evaluation of noncoverage bias in NHES:2007.

8.1 An Examination of Nonresponse Bias

As discussed in chapter 3, prior to selecting the sample for the Bias Study, telephone numbers were matched to addresses to the extent possible. When a telephone number was available for a sampled address, the case was attempted by the Telephone Research Center (TRC) using the standard telephone data collection protocol. When the Screener could not be completed by telephone (due to noncontact, unit nonresponse, or the lack of a matching telephone number), the case was sent to the field for attempts to complete an interview, as described in chapter 4.

Thus, nonresponse bias can be assessed by examining differences in estimates from the reduced effort (completed extended interviews from FT/RT cells of figure 4-1) and the full effort (completed extended interviews from FT/RT and FTO cells of figure 4-1).[45] Nonmatched cases (Bias Study cases with no telephone number match available) could not be attempted by the TRC, but were attempted in the field. Thus, it should be noted that the reduced effort estimates were calculated using data from both the TRC respondents and the nonmatched cases, in order to eliminate the effect nonmatched cases would have on estimates of nonresponse bias. The weighting and estimation approach used to include the nonmatched cases in the reduced effort estimates is discussed in chapter 6.

[45] As discussed in chapter 5, in the reduced effort, the Telephone Research Center (TRC) status is treated as the final household status for Bias Study cases attempted in the TRC. In the full effort, the final household status is based on efforts in both the TRC and in the field. For example, a case that was a final refusal in the TRC but responded to the Screener in the field is treated as a nonrespondent in the reduced effort but as a respondent in the full effort. A total of 4,894 cases was respondents with the full effort, and 4,235 were respondents under the reduced effort.

To better understand the rationale for including the nonmatched cases in both sets, consider the difference between the reduced and full effort estimates as

$$\hat{d} = \hat{y}_R - \hat{y}_F$$
$$= \sum_{trc} w_i y_i + \sum_{nm} w_i y_i - (\sum_{trc} w_i' y_i + \sum_{field} w_i' y_i + \sum_{nm} w_i' y_i)$$

where the subscript sum over *trc* is the respondents in the TRC, *nm* sums over the respondents in the nonmatched cases, *field* sums over the respondents in the field, and the case weights (w_i and w_i') are defined in chapter 6 for the two effort levels. If the weights were identical for the two sets, then it is clear that including the nonmatched cases would have no effect on the estimated difference. The weights do differ, mainly due to the adjustments to population control totals, so this simple result does not hold exactly but the inclusion of the nonmatched cases in both sets should still essentially cancel.

The analyses in Chapter 7 established the effectiveness of the nonresponse adjustments and calibration adjustments in reducing the amount of potential bias in the examined variables. Thus, this chapter focuses on measuring the potential bias in fully weighted estimates (i.e., those computed using nonresponse adjustments and raking). This provides the basis for evaluating the potential for bias due to nonresponse and noncoverage in the published estimates. Nonetheless, as was demonstrated in section 7.3, analyses looking at base-weighted estimates are informative and all analyses shown in this section are replicated using base weights in appendix G. Note that the unadjusted base weight is the product of the household base weight and the reciprocal of the child's or adult's within-household selection probability.

Tables 8-1, 8-2, and 8-3 contain estimates of nonresponse bias for various characteristics from the School Readiness (SR), Parent and Family Involvement in Education (PFI), and Adult Education for Work-Related Reasons (AEWR) surveys, respectively. As is the case with all tables in this chapter, the estimates reflect skip patterns; the denominators of the percentages include only respondents to the item. As these tables demonstrate, the comparison of the full effort estimates to the reduced effort estimates yields no indication of nonresponse bias. There are no significant differences of 5 percentage points or more among any of the comparisons made in the tables. Comparisons using unadjusted base weights give the same conclusions.

Table 8-1. Estimates of nonresponse bias for various characteristics from the School Readiness Survey: NHES:2007 Bias Study

Characteristic	Reduced treatment SR respondents			Full treatment SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Participation in center-based care	143	51.0	2.13	177	51.1	2.29	-0.1	0.85	-0.2
Specific skills									
Recognizes all colors	207	85.0	2.35	249	85.6	2.34	-0.6	0.47	-0.7
Counts to 20 or higher	165	68.5	2.11	198	68.4	2.27	0.2	1.03	0.3
Recognizes all letters	78	29.6	3.59	93	29.4	2.89	0.2	1.11	0.7
Writes first name	158	59.4	3.13	193	60.4	3.08	-0.9	1.07	-1.5
Holds a pencil	210	86.6	2.13	252	86.7	1.90	-0.1	0.66	-0.1
Speech is often understandable to a stranger	207	86.2	2.43	249	87.3	2.17	-1.1	0.45	-1.3
Reads or pretends to read storybooks	242	98.8	0.62	289	99.2	0.45	-0.3	0.19	-0.3
Parents believe it is essential to do certain things to prepare child for kindergarten									
Teach child the alphabet	143	57.7	2.30	171	57.7	2.72	#	0.96	#
Teach child about sharing	149	58.7	2.50	177	57.8	2.97	0.9	1.10	1.6
Teach child to read	117	47.2	4.06	139	48.0	3.47	-0.8	1.06	-1.7
Teach child numbers	129	51.5	2.47	155	51.7	2.64	-0.2	0.85	-0.4
Show child how to hold a pencil	99	37.2	3.11	121	37.9	2.88	-0.7	0.98	-1.8
Family member read to child everyday in the past week	145	57.4	4.43	169	56.9	4.02	0.5	1.35	0.9

See notes at end of table.

Table 8-1. Estimates of nonresponse bias for various characteristics from the School Readiness Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment SR respondents			Full treatment SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents report usually doing certain reading-related activity with child									
Ask child what is in a picture	133	52.8	3.86	159	52.9	4.00	-0.1	0.82	-0.2
Stop reading and point out letters	81	31.6	4.17	95	31.9	4.14	-0.4	0.76	-1.3
Ask child to read with parent	72	29.4	3.35	84	29.7	3.05	-0.3	0.90	-1.0
Talk about the story and what happened	140	59.6	3.29	165	60.3	3.18	-0.7	0.91	-1.2
Parents did home activities with child in the past week[3]	104	41.1	3.14	123	41.7	3.23	-0.6	1.01	-1.4
Parents took 3 or more outings with child in the past month[4]	115	46.3	3.82	138	46.0	3.71	0.3	1.29	0.7
Child watches 2 or more hours of TV in a typical weekday	151	71.4	2.30	179	71.1	2.10	0.4	0.96	0.6
Child has a disability	30	14.8	3.63	37	14.1	3.34	0.7	0.70	5.0
Child's age									
3 years	108	44.6	2.84	128	43.9	2.86	0.7	1.19	1.6
4 years	95	35.6	2.30	116	37.3	2.64	-1.7	1.21	-4.6
5 years and older	42	19.8	3.19	48	18.8	3.08	1.0	0.85	5.3
Child's sex									
Male	145	63.0	3.42	169	62.3	2.97	0.7	1.11	1.1
Female	100	37.0	3.42	123	37.7	2.97	-0.7	1.11	-1.9

See notes at end of table.

Table 8-1. Estimates of nonresponse bias for various characteristics from the School Readiness Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment SR respondents			Full treatment SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Household urbanicity									
Urban	205	80.1	1.97	247	80.8	1.62	-0.7	0.44	-0.9
Rural	40	19.9	1.97	45	19.2	1.62	0.7	0.44	3.6
Home tenure									
Own	165	62.2	0.72	201	62.1	0.87	0.1	0.36	0.2
Rent/other	80	37.8	0.72	91	37.9	0.87	-0.1	0.36	-0.3
Parents' educational attainment									
High school diploma or below	76	34.3	3.40	91	34.5	3.80	-0.3	0.83	-0.9
Beyond high school diploma	169	65.7	3.40	201	65.5	3.80	0.3	0.83	0.5
Parents' language									
Both/only parent(s) speak(s) English	212	87.7	2.53	254	88.0	2.48	-0.3	0.31	-0.3
One of two parents speaks English	‡	‡	‡	‡	‡	‡	‡	‡	‡
No parent speaks English	26	11.3	2.62	29	11.0	2.60	0.3	0.32	2.7
Mothers' employment status									
35 hours or more per week	89	39.2	3.09	111	41.6	3.34	-2.5	0.66	-6.0
Less than 35 hours per week	55	20.2	3.24	69	20.4	3.21	-0.2	0.71	-1.0
Looking for work	23	11.3	2.58	23	10.0	2.49	1.3	0.31	13.0
Not in labor force	74	27.8	2.85	83	26.1	2.65	1.7	0.59	6.5
No mother in household	4!	1.5!	1.15!	6!	1.9!	1.18!	-0.4	0.48	-21.1!

See notes at end of table.

Table 8-1. Estimates of nonresponse bias for various characteristics from the School Readiness Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment SR respondents			Full treatment SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Poverty status									
Poor	61	24.7	2.29	80	24.5	2.19	0.2	0.39	0.8
Nonpoor	184	75.3	2.29	212	75.5	2.19	-0.2	0.39	-0.3
Household income									
Less than $15,000	39	15.1	1.95	52	15.3	1.71	-0.2	0.50	-1.3
$15,001 to $30,000	47	17.5	2.65	62	17.6	2.39	-0.1	0.54	-0.6
$30,001 to $50,000	42	16.6	2.71	50	17.6	2.77	-1.0	0.64	-5.7
More than $50,000	117	50.8	3.23	128	49.5	2.92	1.3	0.92	2.6
Family structure									
Mother and father	187	74.3	4.61	219	73.4	4.36	0.9	0.96	1.2
Mother	49	22.3	3.39	60	22.4	3.09	-0.1	0.88	-0.4
Father	4!	1.5!	1.15!	6!	1.9!	1.18!	-0.4	0.48	-21.1!
Nonparent guardian(s)	5	1.9	0.83	7	2.3	0.96	-0.4	0.46	-17.4

Rounds to zero.
! Interpret with caution.
‡ Reporting standards not met.
[1] Bias is estimated as the difference between the reduced treatment SR respondent estimate and the full treatment SR respondent estimate.
[2] Relative bias is estimated as the bias estimate divided by the full treatment SR respondent estimate, and is expressed as a percentage.
[3] Told child a story; taught child letters, words, or numbers; taught child songs or music; did arts and crafts with child; played sports, active games or exercised together; and played board games or did puzzles with child.
[4] Any three or more of the following: Visited a library; visited a bookstore; went to a play, concert, or other live show; visited an art gallery, museum, or historical site; visited a zoo or aquarium; attended an event sponsored by a community, religious, or ethnic group; and attended an athletic or sporting event (outside of school) in which the child was not a player.
SOURCE: U.S. Department of Education, National Center for Education Statistics, School Readiness (SR) Survey of the National Household Education Surveys Program, 2007.

Table 8-2. Estimates of nonresponse bias for various characteristics from the Parent and Family Involvement in Education (PFI) Survey: NHES:2007 Bias Study

Characteristic	Reduced treatment PFI respondents			Full treatment PFI respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents participate in 5 or more activities in the student's school[3]	478	51.0	2.39	566	52.1	2.22	-1.1	0.53	-2.1
Parents report school provides information very well									
About how student is doing in school	568	58.5	2.15	668	58.2	2.20	0.3	0.49	0.5
About how to help student with his/her homework	449	48.6	2.04	525	47.9	2.07	0.7	0.50	1.5
About why student is placed in particular groups or classes	419	45.9	1.57	496	45.6	1.67	0.3	0.54	0.7
About how to help student plan for college or vocational school	205	40.1	1.60	237	38.9	1.65	1.1	0.72	2.8
About the family's expected role at student's school	460	47.5	1.92	539	46.9	1.93	0.6	0.54	1.3
Parent reports being very satisfied with 4 or more aspects of the student's school[4]	685	74.4	1.80	798	73.7	1.87	0.8	0.69	1.1
Parents participated in 5 or more home learning activities[5]	194	42.0	2.57	229	42.2	2.28	-0.3	0.62	-0.7
Parents took 3 or more outings with student in the past month[6]	472	49.5	2.25	559	50.3	2.09	-0.8	0.47	-1.6

See notes at end of table.

Table 8-2. Estimates of nonresponse bias for various characteristics from the Parent and Family Involvement in Education (PFI) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment PFI respondents			Full treatment PFI respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents check to see that student's homework gets done	748	87.3	1.06	885	87.9	0.99	-0.5	0.37	-0.6
Parents received information about free tutoring	396	42.1	2.25	465	42.6	2.15	-0.4	0.66	-0.9
Parent expects student to earn a college degree or higher	369	67.8	3.38	424	67.2	2.87	0.6	0.87	0.9
Family plans to help pay for student's education after high school	414	83.5	2.24	475	83.1	2.19	0.4	0.74	0.5
Student participated in school activities	531	55.8	2.25	624	55.8	1.89	0.1	0.72	0.2
Student has a disability	211	21.7	2.15	257	23.0	2.16	-1.3	0.63	-5.7
Student's sex									
Male	500	52.1	2.19	575	51.8	2.10	0.3	0.49	0.6
Female	459	47.9	2.19	548	48.2	2.10	-0.3	0.49	-0.6
Household urbanicity									
Urban	797	81.7	0.08	933	81.8	0.06	#	0.03	#
Rural	162	18.3	0.08	190	18.2	0.06	#	0.03	#
Home tenure									
Own	708	69.7	0.77	837	69.7	0.80	#	0.13	#
Rent/other	251	30.3	0.77	286	30.3	0.80	#	0.13	#

See notes at end of table.

Table 8-2. Estimates of nonresponse bias for various characteristics from the Parent and Family Involvement in Education (PFI) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment PFI respondents			Full treatment PFI respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents' educational attainment									
High school diploma or below	269	31.0	2.35	326	31.7	2.31	-0.7	0.54	-2.2
Beyond high school diploma	690	69.0	2.35	797	68.3	2.31	0.7	0.54	1.0
Parents' language									
Both/only parent(s) speak(s) English	861	90.8	1.18	1012	90.9	1.29	-0.1	0.24	-0.1
One of two parents speaks English	20	2.1	0.55	22	2.1	0.61	0.0	0.15	0.0
No parent speaks English	59	7.1	1.18	66	7.0	1.17	0.1	0.15	1.4
Mothers' employment status									
35 hours or more per week	445	46.4	2.27	521	47.0	2.12	-0.6	0.58	-1.3
Less than 35 hours per week	219	21.3	2.01	260	21.1	1.68	0.2	0.42	0.9
Looking for work	41	4.3	0.68	45	4.1	0.56	0.2	0.28	4.9
Not in labor force	207	23.7	1.43	241	23.4	1.24	0.3	0.74	1.3
No mother in household	47	4.3	0.51	56	4.4	0.55	-0.1	0.24	-2.3
Poverty status									
Poor	164	19.2	1.04	221	19.7	1.05	-0.5	0.24	-2.5
Nonpoor	795	80.8	1.04	902	80.3	1.05	0.5	0.24	0.6
Household income									
Less than $15,000	115	13.1	0.64	153	12.9	0.64	0.1	0.33	0.8
$15,001 to $30,000	141	14.9	1.33	179	15.2	1.22	-0.3	0.37	-2.0
$30,001 to $50,000	152	16.4	2.26	171	16.6	2.23	-0.2	0.39	-1.2
More than $50,000	551	55.7	2.32	620	55.3	2.22	0.4	0.48	0.7

See notes at end of table.

Table 8-2. Estimates of nonresponse bias for various characteristics from the Parent and Family Involvement in Education (PFI) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment PFI respondents			Full treatment PFI respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Family structure									
Mother and father	706	73.2	2.04	823	74.1	1.88	-0.9	0.69	-1.2
Mother	172	19.6	1.83	204	18.6	1.61	0.9	0.69	4.8
Father	45	3.9	0.36	54	4.0	0.42	-0.2	0.24	-5.0
Nonparent guardian(s)	36	3.3	0.59	42	3.3	0.55	0.1	0.11	3.0
School type									
Public	840	89.3	1.71	989	89.9	1.65	-0.6	0.36	-0.7
Private	101	10.7	1.71	114	10.1	1.65	0.6	0.36	5.9
School size									
Under 300	148	15.2	1.50	167	14.6	1.51	0.6	0.33	4.1
300-599	275	28.3	2.63	321	28.8	2.59	-0.5	0.43	-1.7
600-999	241	26.1	1.84	286	25.8	1.81	0.4	0.70	1.6
1,000 or more	272	30.3	1.88	323	30.8	1.65	-0.5	0.58	-1.6

Rounds to zero.

[1] Bias is estimated as the difference between the reduced treatment PFI respondent estimate and the full treatment PFI respondent estimate.

[2] Relative bias is estimated as the bias estimate divided by the full treatment PFI respondent estimate, and is expressed as a percentage.

[3] Any five or more of the following: Attended a general school meeting; attended a meeting of the parent-teacher organization or association; went to a regularly scheduled parent-teacher conference with the student's teacher; attended a school or class event because of the student; served as a volunteer in the student's classroom or elsewhere in the school; participated in fundraising for the school; served on a school committee; and met with a guidance counselor in person.

[4] Any four or more of the following: School student attends this year; teachers student has this year; academic standards of the school; order and discipline at the school; and way that school staff interact with parents.

[5] Any five or more of the following: Told student a story; did arts and crafts with student; played sports, active games or exercised together; worked on projects such as building, making, or fixing something with student not as a chore; talked with student about family history or ethnic heritage; and played board games or did puzzles with student.

[6] Any three or more of the following: Visited a library; visited a bookstore; went to a play, concert, or other live show; visited an art gallery, museum, or historical site; visited a zoo or aquarium; attended an event sponsored by a community, religious, or ethnic group; and attended an athletic or sporting event (outside of school) in which the student was not a player.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education (PFI) Survey of the National Household Education Surveys Program, 2007.

Table 8-3. Estimates of nonresponse bias for various characteristics from the Adult Education for Work-Related Reasons (AEWR) Survey: NHES:2007 Bias Study

Characteristic	Reduced treatment AEWR respondents			Full treatment AEWR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Participates in adult education for work-related reasons	433	39.3	2.02	495	39.1	1.76	0.2	0.63	0.5
Participates in employer-supported AEWR	307	69.5	3.68	347	70.0	3.57	-0.4	0.42	-0.6
Participates in distance education	251	61.3	2.96	285	60.1	2.98	1.2	0.86	2.0
Participates in program to earn a college or university degree	108	9.4	0.90	124	9.4	0.81	#	0.22	#
Participates in program to earn a vocational or technical diploma	48	4.1	0.69	56	4.2	0.70	-0.1	0.18	-2.4
Participates in formal apprenticeship program	5!	0.5!	0.32!	5!	0.5!	0.33!	#	0.03	#
Participates in work-related training or courses	368	33.8	1.66	416	33.2	1.49	0.6	0.62	1.8
Participates in 4 or more informal work-related learning activities[3]	290	29.8	2.49	324	29.2	2.25	0.7	0.58	2.4
Has any condition that limits ability to work	139	15.3	2.61	153	15.2	2.63	0.1	0.33	0.7

See notes at end of table.

Table 8-3. Estimates of nonresponse bias for various characteristics from the Adult Education for Work-Related Reasons (AEWR) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment AEWR respondents			Full treatment AEWR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Age									
16 to 24 years	89	13.6	1.20	104	13.1	1.17	0.5	0.28	3.8
25 to 34 years	143	16.8	1.93	168	17.5	1.86	-0.7	0.38	-4.0
35 to 44 years	111	17.2	1.42	131	16.9	1.31	0.3	0.42	1.8
45 to 54 years	195	21.3	1.76	217	21.4	1.75	-0.1	0.38	-0.5
55 years and older	393	31.2	1.16	445	31.1	1.20	0.1	0.19	0.3
Census region									
Northeast	233	25.6	4.64	259	25.7	4.68	-0.1	0.29	-0.4
Midwest	207	21.8	3.08	235	21.3	2.89	0.4	0.27	1.9
South	260	32.4	2.95	314	32.8	3.28	-0.4	0.39	-1.2
West	231	20.2	0.00	257	20.2	0.00	#	0.00	#
Home tenure									
Own	693	70.6	0.70	794	70.1	0.79	0.5	0.24	0.7
Rent/other	238	29.4	0.70	271	29.9	0.79	-0.5	0.24	-1.7
Household size									
1 person	245	9.4	0.67	278	9.6	0.65	-0.2	0.34	-2.1
More than 1 person	686	90.6	0.67	787	90.4	0.65	0.2	0.34	0.2
Marital status									
Never married	217	24.5	1.43	249	24.2	1.42	0.3	0.48	1.2
Currently married	468	56.5	2.00	531	55.9	2.06	0.6	0.66	1.1
Other	246	19.0	1.77	285	20.0	1.69	-1.0	0.45	-5.0

See notes at end of table.

Table 8-3. Estimates of nonresponse bias for various characteristics from the Adult Education for Work-Related Reasons (AEWR) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment AEWR respondents			Full treatment AEWR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Household income									
Less than $15,000	154	10.5	0.62	194	10.6	0.54	-0.1	0.17	-0.9
$15,001 to $30,000	173	16.0	1.33	212	16.1	1.24	-0.1	0.23	-0.6
$30,001 to $50,000	171	22.2	1.56	188	23.1	1.59	-0.9	0.49	-3.9
More than $50,000	433	51.4	1.36	471	50.3	1.30	1.1	0.53	2.2
Language spoken most at home									
English	876	93.1	1.44	999	92.4	1.60	0.7	0.29	0.8
Spanish	33	4.5	1.00	39	4.7	1.08	-0.3	0.17	-6.4
Other language	15	1.8	0.81	18	2.1	0.89	-0.3	0.18	-14.3
English and Spanish equally	7	0.6	0.31	8	0.7	0.31	#	0.03	#
English and other language equally	#	#	#	‡	‡	‡	‡	‡	‡
Employment status									
Employed	551	61.2	2.04	627	61.2	1.93	#	0.50	#
Unemployed but looking for work	36	4.6	1.46	44	5.0	1.28	-0.4	0.54	-8.0
Not in the labor force	344	34.2	1.47	394	33.8	1.35	0.4	0.56	1.2

Rounds to zero.
! Interpret with caution.
‡ Reporting standards not met.
[1] Bias is estimated as the difference between the reduced treatment AEWR respondent estimate and the full treatment AEWR respondent estimate.
[2] Relative bias is estimated as the bias estimate divided by the full treatment AEWR respondent estimate, and is expressed as a percentage.
[3] Any four or more of the following: Received on-the-job demonstrations of equipment, techniques, or procedures by a supervisor or coworker; received other supervised training or mentoring on the job; self-paced study using books, procedures manuals, audio tapes, or videos; self-paced study using computer-based software tutorials; attended "brown-bag" or informal presentations; attended conferences, trade shows, or conventions related to the adult's work or profession; and read professional journals, trade publications, or work-related magazines.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education for Work-Related Reasons Survey of the National Household Education Surveys Program, 2007.

It should be noted that because these results are based on estimates from the full effort (with overall unit response rates of 54.0 percent, 51.4 percent, and 41.0 percent for the School Readiness (SR), Parent and Family Involvement in Education (PFI), and Adult Education for Work-Related Reasons (AEWR) surveys, respectively), this examination of nonresponse bias can only account for bias that would be evident as unit response is increased through the field effort; this comparison does not account for bias due to the proportion that failed to respond to the Screener or the extended interview survey even after the field effort. The results shown here give no indication that those who respond to the field effort but not to the telephone data collection effort are different from those who respond to the telephone attempts.

Section 4.2 included discussions of two data collection instruments that were used in the field effort but are not part of the standard data collection effort: the Interviewer Observation Form (IOF) and the Maximum Call postcard. Field interviewers were instructed to complete the IOF on the first visit to the household, before approaching the household, and to not change any responses based on information gleaned later. For the 5,122 cases sent to the field for in-person attempts,[46] a total of 4,600 IOFs were returned. As noted in section 4.2, of the 635 maximum call Screener cases and maximum call postcards distributed, 222 maximum call postcards, or 35 percent, were returned. These instruments provide data that can be used to extend the nonresponse bias analysis beyond the respondents who were interviewed in the field. Tables 8-4, 8-5, and 8-6 provide the results from the analysis of this remaining nonresponse. Since the tables include estimates for field nonrespondents, this analysis was done using base weighted estimates rather than fully weighted estimates.

Table 8-4 contains the frequency distributions of the IOF items; separate distributions are given for field respondents and for field nonrespondents to evaluate the potential bias due to not obtaining a 100 percent response rate in the field. The field respondents and field nonrespondents differ in socioeconomic classification, evidence of children, and the appearance of signs for private security services. Interviewers classified the household as working class or poor for 40 percent of the field respondents compared to 34 percent of the field nonrespondents. The percentage of addresses for which the field interviewer indicated evidence of children was higher for field respondents than for field nonrespondents (23 percent versus 12 percent). Also, the percentage of cases for which the field interviewer indicated finding no houses/apartments on the block with signs for private security services was higher for field respondents than for field nonrespondents (64 percent versus 54 percent).

[46] This includes the 18 Bias Study cases completed during TRC efforts that were verified as having a correct address-telephone matched in the field.

Table 8-4. Distributions of characteristics collected in the Interviewer Observation Form (IOF), for field respondents and field nonrespondents separately: NHES:2007 Bias Study

Characteristic	Bias Study Screener field respondents			Bias Study Screener field nonrespondents		
	Sample size	Percent	Standard Error	Sample size	Percent	Standard Error
Household characteristics						
Socioeconomic classification						
Affluent or upper middle class	211	7.8	1.42	214	9.7	1.67
Middle-middle class	1,303	51.0	3.09	1,117	53.8	2.53
Working class or poor	1,003	39.9	3.12	670	33.8	2.68
Missing	33	1.2	0.34	49	2.6	0.74
Evidence of children						
Yes	590	22.6	1.09	255	12.0	1.05
No	1,913	75.6	1.10	1,717	83.9	1.31
Missing	47	1.8	0.39	78	4.1	0.77
Bars or gratings on doors or windows						
Yes	193	7.8	2.23	186	9.3	2.64
No	2,323	90.9	2.41	1,794	86.9	2.65
Missing	34	1.3	0.31	70	3.8	0.84
Signs for private security services						
Yes	272	10.4	1.04	268	12.7	1.29
No	2,237	88.1	1.32	1,705	83.1	1.63
Missing	41	1.5	0.40	77	4.1	0.75
Block characteristics						
Urbanicity						
Urban	788	32.2	5.43	670	34.4	5.90
Suburban	1,384	54.0	5.01	1,157	54.8	5.41
Rural	351	12.7	2.62	193	9.3	1.80
Missing	27	1.1	0.29	30	1.5	0.60
Traffic flow						
Light	1,757	67.9	1.59	1,373	65.3	3.83
Moderate	569	22.9	1.65	470	23.4	2.61
Heavy	204	8.4	1.11	183	10.1	1.77
Missing	20	0.7	0.21	24	1.2	0.57

See notes at end of table.

Table 8-4. Distributions of characteristics collected in the Interviewer Observation Form (IOF), for field respondents and field nonrespondents separately: NHES:2007 Bias Study—Continued

Characteristic	Bias Study Screener field respondents			Bias Study Screener field nonrespondents		
	Sample size	Percent	Standard Error	Sample size	Percent	Standard Error
Block characteristics—continued						
Abandoned cars						
None	2,171	84.7	1.83	1,793	87.6	2.35
Very few (roughly 1-2 cars)	301	12.4	1.63	205	9.9	1.91
Some (roughly 3-4 cars)	53	2.0	0.40	22	1.0	0.30
Many (roughly 5 or more cars)	7	0.3	0.19	2	0.1	0.05
Missing	18	0.6	0.14	28	1.4	0.63
Trash or junk						
None	1,704	66.9	3.40	1,465	71.0	2.88
Very little	582	22.6	2.42	399	19.6	2.01
Some	208	8.3	1.21	138	6.7	1.12
A lot	43	1.8	0.74	20	1.1	0.42
Missing	13	0.4	0.12	28	1.5	0.69
Land use						
Primarily residential	2,198	86.2	1.62	1,768	85.6	1.45
Primarily commercial	31	1.2	0.38	24	1.1	0.33
Primarily industrial	3	0.1	0.05	1	0.0	0.04
Primarily vacant lots or undeveloped space	49	1.7	0.21	31	1.2	0.28
Mixed residential and commercial	125	5.2	1.04	103	5.7	1.32
Mixed residential and industrial	10	0.4	0.23	15	0.7	0.34
Mixed residential and vacant lots	102	3.9	0.90	57	2.9	0.92
Other	21	0.8	0.32	25	1.3	0.29
Missing	11	0.4	0.12	26	1.3	0.60
Houses/apartments with window/door bars or gratings						
None	1,956	76.3	4.48	1,449	70.7	6.09
Very few	335	13.2	1.92	299	13.7	2.85
Some	167	6.9	2.09	177	9.4	2.46
Most	65	2.6	1.20	86	4.1	1.56
All	8	0.3	0.20	9	0.5	0.32
Missing	19	0.7	0.10	30	1.6	0.60

See notes at end of table.

Table 8-4. Distributions of characteristics collected in the Interviewer Observation Form (IOF), for field respondents and field nonrespondents separately: NHES:2007 Bias Study—Continued

Characteristic	Bias Study Screener field respondents			Bias Study Screener field nonrespondents		
	Sample size	Percent	Standard Error	Sample size	Percent	Standard Error
Block characteristics—continued						
Houses/apartments with signs for private security services						
None	1,642	64.7	2.30	1,109	55.2	3.14
Very few	568	22.0	1.71	543	25.0	1.95
Some	245	9.5	0.97	284	13.9	1.47
Most	59	2.4	0.68	65	3.2	0.75
All	17	0.7	0.68	18	1.1	0.69
Missing	19	0.7	0.15	31	1.6	0.63
Signs for neighborhood watch						
Yes	309	12.2	2.89	272	12.8	2.72
No	2,210	86.7	2.86	1,736	85.1	2.99
Missing	31	1.2	0.24	42	2.1	0.65
Children						
Yes	893	34.3	2.54	690	33.5	4.08
No	1,628	64.6	2.56	1,322	64.6	4.40
Missing	29	1.1	0.25	38	1.9	0.57
Interviewer heard non-English language spoken in neighborhood						
Yes	246	10.0	2.16	290	15.0	3.67
No	1,149	44.0	4.84	827	39.3	4.70
No people around or did not hear any language	1,134	45.3	5.09	904	44.2	5.28
Missing	21	0.7	0.21	29	1.5	0.58

NOTE: Shading indicates a significant difference of 5 percentage points or more. Estimates were produced using base weights.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

In addition to the interviewer-reported characteristics in the IOF, ZIP code-level characteristics were obtained from the Census 2000 Summary Files (SFs), and distributions of these ZIP code characteristics are given for field respondents and field nonrespondents (separately) in table 8-5. The characteristics given in table 8-5 were selected for consideration because they are available at the ZIP code-level from the Census 2000 SFs and are also available on the sampling frame used to select the RDD sample. There are some substantive differences between ZIP code-level characteristics of field

respondents and field nonrespondents. A higher percentage of field respondents than nonrespondents live in ZIP codes with lower median home values (74 percent versus 63 percent in the first through seventh deciles) and lower median income deciles (35 percent versus 28 percent in the first through third deciles).

Table 8-5. Distributions of ZIP code-level characteristics, for field respondents and field nonrespondents separately: NHES:2007 Bias Study

Characteristic	Bias Study Screener field respondents			Bias Study Screener field nonrespondents		
	Sample size	Percent	Standard Error	Sample size	Percent	Standard Error
Census region						
Northeast	557	20.7	3.09	485	22.9	3.90
Midwest	486	19.4	3.00	333	15.4	2.77
South	906	35.0	1.77	696	34.0	2.63
West	601	24.9	1.77	536	27.8	2.10
Metro status						
In an MSA	2,405	94.7	0.33	1,950	95.5	0.48
Not in an MSA	145	5.3	0.33	100	4.5	0.48
Median home value						
1st through 7th deciles	1,902	74.4	4.67	1,292	62.7	5.96
8th through 10th deciles	648	25.6	4.67	758	37.3	5.96
Median income						
1st through 3rd deciles	891	35.3	4.96	546	27.7	4.29
4th through 10th deciles	1,659	64.7	4.96	1,504	72.3	4.29
Percent college graduates						
Less than 20 percent	854	33.6	5.15	556	27.8	5.23
20 to 29 percent	658	25.8	3.87	574	27.6	3.63
30 to 39 percent	497	19.5	2.96	403	19.4	2.76
40 to 59 percent	484	18.7	2.78	449	21.6	3.16
60 percent or more	57	2.4	0.89	68	3.7	1.46
Percent White						
Less than 30 percent	182	7.5	2.77	255	12.9	5.19
30 to 49 percent	302	12.4	3.19	206	10.9	3.10
50 to 69 percent	363	14.8	4.18	336	17.3	4.06
70 to 89 percent	656	26.3	3.40	474	23.1	3.81
90 percent or more	1,047	39.1	6.74	779	35.8	5.48

See notes at end of table.

Table 8-5. Distributions of ZIP code-level characteristics, for field respondents and field nonrespondents separately: NHES:2007 Bias Study—Continued

Characteristic	Bias Study Screener field respondents			Bias Study Screener field nonrespondents		
	Sample size	Percent	Standard Error	Sample size	Percent	Standard Error
Percent Black						
Less than 50 percent	2,394	93.6	1.66	1,931	94.0	1.27
50 to 59 percent	106	4.5	1.92	62	3.2	1.35
60 percent or more	50	1.9	1.00	57	2.9	1.57
Percent Hispanic						
Less than 20 percent	1,865	72.2	6.75	1,364	65.0	7.37
20 to 39 percent	394	15.8	4.35	365	18.7	4.82
40 to 59 percent	164	6.6	2.39	132	6.5	2.26
60 percent or more	127	5.4	2.22	189	9.8	4.11
Percent renters						
Less than 30 percent	864	32.3	4.75	692	32.2	4.76
30 to 59 percent	1,389	55.2	4.84	1,060	51.9	4.57
60 percent or more	297	12.5	4.16	298	15.9	4.36
Percent owners						
Less than 40 percent	140	5.5	2.20	171	9.0	3.00
40 to 69 percent	834	34.6	3.40	667	33.8	3.70
70 percent or more	1,576	59.9	4.23	1,212	57.3	5.07

NOTE: Shading indicates a significant difference of 5 percentage points or more. Estimates were produced using base weights.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

Table 8-6 gives the distributions of characteristics that were collected in the Maximum Call postcard. For the Bias Study respondents (whether they responded to the telephone effort or responded as a result of the field follow-up), these items were collected in the Screener. For the field nonrespondents, these items were obtained from the postcard. Although two additional items—household size and highest education—were also asked on the postcard, the distributions of those two items are not presented here because, for respondents, these items are available only if at least one extended interview was completed in the household.

Table 8-6. Distributions of characteristics collected in the Maximum Call postcard: NHES:2007 Bias Study

Household characteristic	Bias study respondents			Bias Study TRC respondents			Bias Study field respondents			Bias Study field nonrespondents with MC postcard		
	Sample size	Percent	Standard error	Sample size	Percent	Standard error	Sample size	Percent	Standard error	Sample size	Percent	Standard error
Number of children under 18												
None	3,120	63.4	1.10	1,644	70.1	1.21	1,476	59.0	1.42	127	71.0	2.66
1	751	15.8	0.61	287	12.2	0.68	464	18.1	0.81	26	14.5	2.57
2-3	916	18.5	0.90	382	16.3	1.08	534	20.0	1.05	28	13.7	2.13
4+	107	2.3	0.25	31	1.3	0.32	76	2.9	0.36	2	‡	‡
Home ownership												
Own	3,570	69.0	1.53	2,024	86.3	0.96	1,546	57.8	1.98	129	64.9	3.99
Rent/other	1,324	31.0	1.53	320	13.7	0.96	1,004	42.2	1.98	54	35.1	3.99

‡ Reporting standards not met.

NOTE: Estimates were produced using base weights.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Surveys Program (NHES), 2007.

As shown in table 8-6, a larger percentage of telephone respondents than field respondents have no children under 18 (70 percent versus 59 percent). These results appear to be anomalous, in that all other evidence (in both the Bias Study and the NHES RDD surveys) has indicated that a higher percentage of households with children respond to the telephone Screener than households without children. However, the field respondents include cases with no matching telephone number or a mismatched number, not just TRC nonrespondents. Considering all Bias Study respondents (in both the TRC and the field), 63 percent have no children under 18, compared to 71 percent among field nonrespondents who returned the Maximum Call postcard. In terms of home tenure, a larger percentage of Bias Study telephone respondents than field respondents own their homes (86 percent versus 58 percent), and 65 percent of field nonrespondents own their homes.

8.2 An Examination of Noncoverage Bias

Because the Bias Study sample is based on a sample of addresses, it includes persons residing in both telephone and nontelephone households. For this section, nontelephone households are defined as those without a landline so that the noncoverage bias associated with standard RDD surveys that do not include cell phones can be estimated. The NHES:2007 Bias Study survey instruments included a series of questions to capture the presence and number of telephone numbers in the household, so nontelephone households can be identified through the responses to these questions.

In order to examine noncoverage bias in NHES:2007 estimates, fully weighted estimates from the full Bias Study sample (completed extended interviews from FT/RT and FTO cells of figure 4-1) were compared to estimates from the Bias Study sample restricted to telephone households (telephone household field respondents cell of figure 4-1). The weights for the telephone households were separately raked to population totals, since estimates of noncoverage bias in the Bias Study telephone household estimates are intended to provide an indication of noncoverage bias in the final RDD estimates, which included the raking adjustment. The estimates are tabulated for a set of characteristics in tables 8-7, 8-8, and 8-9, for the SR, PFI, and AEWR surveys, respectively.

Table 8-7. Estimates of noncoverage bias for various characteristics from the School Readiness (SR) Survey: NHES:2007 Bias Study

Characteristic	Full treatment SR respondents			With landline phone			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Participation in center-based care	177	51.1	2.29	159	53.4	2.11	2.4	0.96	4.5
Specific skills									
Recognizes all colors	249	85.6	2.34	212	84.4	3.93	-1.2	2.21	-1.4
Counts to 20 or higher	198	68.4	2.27	170	67.2	3.22	-1.2	2.57	-1.8
Recognizes all letters	93	29.4	2.89	80	28.9	2.78	-0.5	1.87	-1.7
Writes first name	193	60.4	3.08	171	62.9	3.88	2.5	2.20	4.1
Holds a pencil	252	86.7	1.90	212	85.6	2.18	-1.2	1.65	-1.3
Speech is often understandable to a stranger	249	87.3	2.17	210	87.0	1.95	-0.3	1.39	-0.3
Reads or pretends to read storybooks	289	99.2	0.45	243	99.0	0.56	-0.2	0.14	-0.2
Parents believe it is essential to do certain things to prepare child for kindergarten									
Teach child the alphabet	171	57.7	2.72	149	61.3	2.73	3.6	1.54	6.2
Teach child about sharing	177	57.8	2.97	155	61.4	4.14	3.6	2.49	6.2
Teach child to read	139	48.0	3.47	119	50.1	4.64	2.1	2.70	4.4
Teach child numbers	155	51.7	2.64	136	56.3	3.00	4.6	2.52	8.9
Show child how to hold a pencil	121	37.9	2.88	106	40.3	3.56	2.4	2.56	6.3
Family member read to child everyday in the past week	169	56.9	4.02	142	54.9	5.56	-2.1	3.15	-3.5
Parents report usually doing certain reading-related activity with child									
Ask child what is in a picture	159	52.9	4.00	134	52.8	4.40	-0.1	3.00	-0.2
Stop reading and point out letters	95	31.9	4.14	85	34.5	4.22	2.5	3.42	8.2
Ask child to read with parent	84	29.7	3.05	71	27.0	3.50	-2.7	3.17	-9.1
Talk about the story and what happened	165	60.3	3.18	137	58.0	4.02	-2.3	2.41	-3.8
Parents did home activities with child in the past week[3]	123	41.7	3.23	101	38.9	3.39	-2.8	2.01	-6.7
Parents took 3 or more outings with child in the past month[4]	138	46.0	3.71	114	44.4	4.08	-1.7	2.55	-3.5

See notes at end of table.

Table 8-7. Estimates of noncoverage bias for various characteristics from the School Readiness (SR) Survey: NHES:2007 Bias Study—Continued

Characteristic	Full treatment SR respondents			With landline phone			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Child watches 2 or more hours of TV in a typical weekday	179	71.1	2.10	145	67.4	2.50	-3.6	1.87	-5.2
Child has a disability	37	14.1	3.34	32	14.5	4.54	0.4	2.20	2.8
Child's age									
3 years	128	43.9	2.86	102	41.5	3.61	-2.4	2.20	-5.5
4 years	116	37.3	2.64	101	38.2	3.81	0.9	2.05	2.4
5 years and older	48	18.8	3.08	43	20.3	4.48	1.6	2.19	8.0
Child's sex									
Male	169	62.3	2.97	137	60.8	3.78	-1.6	2.16	-2.4
Female	123	37.7	2.97	109	39.2	3.78	1.6	2.16	4.0
Household urbanicity									
Urban	247	80.8	1.62	206	80.6	1.65	-0.2	0.22	-0.2
Rural	45	19.2	1.62	40	19.4	1.65	0.2	0.22	1.0
Home tenure									
Own	201	62.1	0.87	175	62.6	0.62	0.5	1.02	0.8
Rent/other	91	37.9	0.87	71	37.4	0.62	-0.5	1.02	-1.3
Parents' educational attainment									
High school diploma or below	91	34.5	3.80	63	25.3	4.13	-9.2	2.47	-26.7
Beyond high school diploma	201	65.5	3.80	183	74.7	4.13	9.2	2.47	14.0
Parents' language									
Both/only parent(s) speak(s) English	254	88.0	2.48	214	88.9	1.90	0.9	1.74	1.0
One of two parents speaks English	‡	‡	‡	‡	‡	‡	‡	‡	‡
No parent speaks English	29	11.0	2.60	25	10.7	1.80	-0.3	1.82	-2.7

See notes at end of table.

Table 8-7. Estimates of noncoverage bias for various characteristics from the School Readiness (SR) Survey: NHES:2007 Bias Study — Continued

Characteristic	Full treatment SR respondents			With landline phone			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Mothers' employment status									
35 hours or more per week	111	41.6	3.34	94	40.5	3.69	-1.1	2.16	-2.6
Less than 35 hours per week	69	20.4	3.21	62	23.2	3.79	2.8	1.18	13.7
Looking for work	23	10.0	2.49	15	8.2	2.33	-1.7	1.42	-18.0
Not in labor force	83	26.1	2.65	70	25.9	2.78	-0.2	2.35	-0.8
No mother in household	6!	1.9!	1.18!	5!	2.2!	1.04!	0.3!	0.33!	15.8!
Poverty status									
Poor	80	24.5	2.19	63	24.6	3.00	0.1	1.60	0.4
Nonpoor	212	75.5	2.19	183	75.4	3.00	-0.1	1.60	-0.1
Household income									
Less than $15,000	52	15.3	1.71	41	13.9	2.69	-1.4	1.91	-9.2
$15,001 to $30,000	62	17.6	2.39	51	20.5	3.60	2.9	2.54	16.5
$30,001 to $50,000	50	17.6	2.77	41	15.6	2.73	-2.0	1.34	-11.4
More than $50,000	128	49.5	2.92	113	50.0	3.48	0.5	1.15	1.0
Family structure									
Mother and father	219	73.4	4.36	187	72.8	4.20	-0.7	1.96	-0.8
Mother	60	22.4	3.09	48	22.3	3.60	-0.1	2.17	-0.4
Father	6!	1.9!	1.18!	5!	2.2	1.04	0.3	0.33	15.8!
Nonparent guardian(s)	7	2.3	0.96	6	2.8	1.17	0.5	0.77	21.7

See notes at end of table.
! Interpret with caution.
‡ Reporting standards not met.
[1] Bias is estimated as the difference between the "with landline phone" SR respondent estimate and the full treatment SR respondent estimate.
[2] Relative bias is estimated as the bias estimate divided by the full treatment SR respondent estimate, and is expressed as a percentage.
[3] Told child a story; taught child letters, words, or numbers; taught child songs or music; did arts and crafts with child; played sports, active games or exercised together; and played board games or did puzzles with child.
[4] Any three or more of the following: Visited a library; visited a bookstore; went to a play, concert, or other live show; visited an art gallery, museum, or historical site; visited a zoo or aquarium; attended an event sponsored by a community, religious, or ethnic group; and attended an athletic or sporting event (outside of school) in which the child was not a player.
NOTE: Shading indicates a significant difference of 5 percentage points or more.
SOURCE: U.S. Department of Education, National Center for Education Statistics, School Readiness (SR) Survey of the National Household Education Surveys Program, 2007.

Table 8-8. Estimates of noncoverage bias for various characteristics from the Parent and Family Involvement (PFI) Survey: NHES:2007 Bias Study

Characteristic	Full treatment PFI respondents			With landline phone			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents participate in 5 or more activities in the student's school[3]	566	52.1	2.22	500	54.6	2.67	2.6	1.18	4.8
Parents report school provides information very well									
About how student is doing in school	668	58.2	2.20	582	60.8	1.81	2.6	1.34	4.5
About how to help student with his/her homework	525	47.9	2.07	455	49.0	2.39	1.2	1.22	2.3
About why student is placed in particular groups of classes	496	45.6	1.67	432	46.7	2.27	1.0	1.26	2.4
About how to help student plan for college or vocational school	237	38.9	1.65	210	39.1	1.94	0.1	1.06	0.5
About the family's expected role at student's school	539	46.9	1.93	473	48.2	2.34	1.3	1.37	2.8
Parent reports being very satisfied with 4 or more aspects of the student's school[4]	798	73.7	1.87	685	73.2	2.17	-0.4	1.00	-0.7
Parents participated in 5 or more home learning activities[5]	229	42.2	2.28	197	45.3	2.62	3.1	1.62	7.3
Parents took 3 or more outings with student in the past month[6]	559	50.3	2.09	494	52.2	2.25	1.9	1.14	3.8
Parents check to see that student's homework gets done	885	87.9	0.99	754	87.6	1.04	-0.2	0.54	-0.3
Parents received information about free tutoring	465	42.6	2.15	395	43.0	2.55	0.4	1.27	0.9
Parent expects student to earn a college degree or higher	424	67.2	2.87	380	69.7	2.98	2.5	1.79	3.7
Family plans to help pay for student's education after high school	475	83.1	2.19	420	82.1	2.62	-1.0	1.24	-1.2
Student participated in school activities	624	55.8	1.89	550	56.9	2.27	1.1	1.25	2.0
Student has a disability	257	23.0	2.16	213	21.9	1.70	-1.1	1.09	-4.8

See notes at end of table.

Table 8-8. Estimates of noncoverage bias for various characteristics from the Parent and Family Involvement (PFI) Survey: NHES:2007 Bias Study—Continued

Characteristic	Full treatment PFI respondents			With landline phone			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Student's sex									
Male	575	51.8	2.10	484	49.9	2.46	-1.8	1.23	-3.7
Female	548	48.2	2.10	481	50.1	2.46	1.8	1.23	3.9
Household urbanicity									
Urban	933	81.8	0.06	796	81.7	0.11	-0.1	0.06	-0.1
Rural	190	18.2	0.06	169	18.3	0.11	0.1	0.06	0.5
Home tenure									
Own	837	69.7	0.80	743	70.2	0.67	0.5	0.45	0.7
Rent/other	286	30.3	0.80	222	29.8	0.67	-0.5	0.45	-1.7
Parents' educational attainment									
High school diploma or below	326	31.7	2.31	259	29.4	2.38	-2.4	1.05	-7.3
Beyond high school diploma	797	68.3	2.31	706	70.6	2.38	2.4	1.05	3.4
Parents' language									
Both/only parent(s) speak(s) English	1012	90.9	1.29	884	91.8	1.34	0.9	0.74	1.0
One of two parents speaks English	22	2.1	0.61	17	2.1	0.78	#	0.39	#
No parent speaks English	66	7.0	1.17	49	6.0	1.23	-1.0	0.66	-14.3
Mothers' employment status									
35 hours or more per week	521	47.0	2.12	448	47.1	2.33	0.1	1.26	0.2
Less than 35 hours per week	260	21.1	1.68	235	22.8	1.91	1.8	0.91	8.1
Looking for work	45	4.1	0.56	35	3.6	0.69	-0.4	0.54	-12.2
Not in labor force	241	23.4	1.24	200	21.9	2.17	-1.5	1.79	-6.4
No mother in household	56	4.4	0.55	47	4.5	0.64	0.1	0.45	2.3
Poverty status									
Poor	221	19.7	1.05	173	20.5	1.11	0.7	0.59	4.1
Nonpoor	902	80.3	1.05	792	79.5	1.11	-0.7	0.59	-1.0

See notes at end of table.

Table 8-8. Estimates of noncoverage bias for various characteristics from the Parent and Family Involvement (PFI) Survey: NHES:2007 Bias Study—Continued

Characteristic	Full treatment PFI respondents			With landline phone			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Household income									
Less than $15,000	153	12.9	0.64	115	12.0	0.73	-0.9	0.67	-7.0
$15,001 to $30,000	179	15.2	1.22	144	16.2	1.30	0.9	1.03	6.6
$30,001 to $50,000	171	16.6	2.23	142	15.9	2.49	-0.7	0.54	-4.2
More than $50,000	620	55.3	2.22	564	55.9	2.50	0.6	0.78	1.1
Family structure									
Mother and father	823	74.1	1.88	723	74.6	2.30	0.6	1.08	0.7
Mother	204	18.6	1.61	164	17.9	2.15	-0.7	1.01	-3.8
Father	54	4.0	0.42	47	4.5	0.64	0.4	0.41	12.5
Nonparent guardian(s)	42	3.3	0.55	31	3.0	0.67	-0.3	0.71	-9.1
School type									
Public	989	89.9	1.65	845	89.0	1.62	-0.9	0.62	-1.0
Private	114	10.1	1.65	103	11.0	1.62	0.9	0.62	8.9
School size									
Under 300	167	14.6	1.51	144	14.4	1.75	-0.2	0.91	-1.4
300-599	321	28.8	2.59	275	29.6	2.49	0.8	1.11	2.8
600-999	286	25.8	1.81	250	26.6	1.56	0.9	0.71	3.1
1,000 or more	323	30.8	1.65	274	29.4	1.86	-1.4	0.76	-4.5

Rounds to zero.

[1] Bias is estimated as the difference between the "with landline phone" PFI respondent estimate and the full treatment PFI respondent estimate.

[2] Relative bias is estimated as the bias estimate divided by the full treatment PFI respondent estimate, and is expressed as a percentage.

[3] Any five or more of the following: Attended a general school meeting; attended a meeting of the parent-teacher organization or association; went to a regularly scheduled parent-teacher conference with the student's teacher; attended a school or class event because of the student; served as a volunteer in the student's classroom or elsewhere in the school; participated in fundraising for the school; served on a school committee; and met with a guidance counselor in person.

[4] Any four or more of the following: School student attends this year; teachers student has this year; academic standards of the school; order and discipline at the school; and way that school staff interact with parents.

[5] Any five or more of the following: Told student a story; did arts and crafts with student; played sports, active games or exercised together; worked on projects such as building, making, or fixing something with student not as a chore; talked with student about family history or ethnic heritage; and played board games or did puzzles with student.

[6] Any three or more of the following: Visited a library; a bookstore; went to a play, concert, or other live show; visited an art gallery, museum, or historical site; visited a zoo or aquarium; attended an event sponsored by a community, religious, or ethnic group; and attended an athletic or sporting event (outside of school) in which the student was not a player.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education (PFI) Survey of the National Household Education Surveys Program, 2007.

Table 8-9. Estimates of noncoverage bias for various characteristics from the Adult Education for Work-Related Reasons (AEWR) Survey: NHES:2007 Bias Study

Characteristic	Full treatment AEWR respondents			With landline phone			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Participates in adult education for work-related reasons	495	39.1	1.76	395	37.1	2.14	-1.9	1.57	-5.4
Participates in employer-supported AEWR	347	70.0	3.57	280	69.5	3.18	-0.5	2.69	-0.7
Participates in distance education	285	60.1	2.98	234	62.1	2.85	2.1	2.28	3.2
Participates in program to earn a college or university degree	124	9.4	0.81	82	8.5	1.04	-1.0	0.80	-10.6
Participates in program to earn a vocational or technical diploma	56	4.2	0.70	46	4.2	1.06	#	0.61	#
Participates in formal apprenticeship program	5!	0.5!	0.33!	3!	0.3!	0.14!	-0.2!	0.31!	-40.0!
Participates in work-related training or courses	416	33.2	1.49	336	31.0	1.89	-2.2	1.41	-7.1
Participates in 4 or more informal work-related learning activities[3]	324	29.2	2.25	275	31.4	2.69	2.2	1.20	7.0
Has any condition that limits ability to work	153	15.2	2.63	126	14.8	2.80	-0.4	1.23	-2.7
Age									
16 to 24 years	104	13.1	1.17	60	12.7	1.61	-0.4	0.85	-3.1
25 to 34 years	168	17.5	1.86	119	17.8	2.55	0.3	1.35	1.7
35 to 44 years	131	16.9	1.31	112	18.4	1.40	1.5	0.91	8.2
45 to 54 years	217	21.4	1.75	184	18.9	1.29	-2.5	1.18	-13.2
55 years and older	445	31.1	1.20	411	32.2	1.15	1.1	0.56	3.4

See notes at end of table.

Table 8-9. Estimates of noncoverage bias for various characteristics from the Adult Education for Work-Related Reasons (AEWR) Survey: NHES:2007 Bias Study—Continued

Characteristic	Full treatment AEWR respondents			With landline phone			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Census region									
Northeast	259	25.7	4.68	231	25.1	5.33	-0.6	1.35	-2.4
Midwest	235	21.3	2.89	203	21.5	3.06	0.2	0.86	0.9
South	314	32.8	3.28	242	33.2	3.83	0.4	0.97	1.2
West	257	20.2	0.00	210	20.2	#	#	#	#
Home tenure									
Own	794	70.1	0.79	709	71.1	0.66	1.0	0.61	1.4
Rent/other	271	29.9	0.79	177	28.9	0.66	-1.0	0.61	-3.5
Household size									
1 person	278	9.6	0.65	211	9.2	0.88	-0.4	0.64	-4.3
More than 1 person	787	90.4	0.65	675	90.8	0.88	0.4	0.64	0.4
Marital status									
Never married	249	24.2	1.42	162	22.8	2.05	-1.3	1.28	-6.1
Currently married	531	55.9	2.06	481	58.3	2.26	2.4	1.41	4.1
Other	285	20.0	1.69	243	18.9	1.92	-1.1	1.33	-5.8
Household income									
Less than $15,000	194	10.6	0.54	137	10.5	0.93	-0.1	0.68	-1.0
$15,001 to $30,000	212	16.1	1.24	173	16.5	1.78	0.4	1.25	2.4
$30,001 to $50,000	188	23.1	1.59	151	20.7	1.79	-2.3	1.44	-11.6
More than $50,000	471	50.3	1.30	425	52.3	1.26	2.1	1.51	3.8

See notes at end of table.

Table 8-9. Estimates of noncoverage bias for various characteristics from the Adult Education for Work-Related Reasons (AEWR) Survey: NHES:2007 Bias Study—Continued

Characteristic	Full treatment AEWR respondents			With landline phone			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Language spoken most at home									
English	999	92.4	1.60	837	93.1	1.49	0.7	0.60	0.8
Spanish	39	4.7	1.08	31	4.9	1.22	0.2	0.47	4.1
Other language	18	2.1	0.89	14	1.6	0.68	-0.5	0.45	-31.3
English and Spanish equally	8	0.7	0.31	3!	0.2!	0.17!	-0.4!	0.26!	-57.1!
English and other language equally	‡	‡	‡	‡	‡	‡	‡	‡	‡
Employment status									
Employed	627	61.2	1.93	510	61.1	1.45	-0.1	1.54	-0.2
Unemployed but looking for work	44	5.0	1.28	34	6.1	1.57	1.1	0.66	18.0
Not in the labor force	394	33.8	1.35	342	32.8	1.52	-1.0	1.60	-3.0

Rounds to zero.
! Interpret with caution.
‡ Reporting standards not met.
[1] Bias is estimated as the difference between the "with landline phone" AEWR respondent estimate and the full treatment AEWR respondent estimate.
[2] Relative bias is estimated as the bias estimate divided by the full treatment AEWR respondent estimate, and is expressed as a percentage.
[3] Any four or more of the following: Received on-the-job demonstrations of equipment, techniques, or procedures by a supervisor or coworker; received other supervised training or mentoring on the job; self-paced study using books, procedures manuals, audio tapes, or videos; self-paced study using computer-based software tutorials; attended "brown-bag" or informal presentations; attended conferences, trade shows, or conventions related to the adult's work or profession; and read professional journals, trade publications, or work-related magazines.
NOTE: Shading indicates a significant difference of 5 percentage points or more.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education for Work-Related Reasons Survey of the National Household Education Surveys Program, 2007.

For the SR Survey, table 8-7 shows that the percentage of preschoolers in telephone households whose parents' highest educational attainment is beyond a high school diploma (75 percent) is higher than the overall percentage of preschoolers whose parents' highest educational attainment is beyond a high school diploma (66 percent). The key estimates for the SR survey, however, are comparable for preschoolers in telephone households and the overall sample. Although there are some statistically significant differences between school-age children in telephone households and school-age children overall (table 8-8), as well as between adults in telephone households and adults overall (table 8-9), none of these differences meet the criterion for substantive importance of at least 5 percentage points. As shown in section 7.3, some differences were found between RDD estimates before and after the raking adjustment, indicating potential noncoverage bias in the pre-raked estimates. Based on the analysis in section 7.3 and the analysis in this section, the raking adjustments appear to be effective in reducing noncoverage bias in the final estimates.

This page is intentionally blank.

9. DISCUSSION

With survey response rates—in particular, random digit dial (RDD) survey response rates—on the decline, the potential for nonresponse bias is an important concern to survey methodologists and data analysts. Response rates are frequently used as a measure of the potential for nonresponse bias. A general perception is that surveys with higher response rates have less potential for nonresponse bias than surveys with lower response rates. Another important attribute is the *face validity* of the survey that is diminished if a high survey response rate is not obtained. In addition, there is increasing concern over noncoverage bias in RDD surveys, as the rate of cell-phone-only households continues to rise.

Several analyses have been conducted to evaluate nonresponse and noncoverage bias in the NHES surveys. As noted in chapter 1, estimates from the NHES:2007 RDD sample and earlier NHES surveys have been compared to other surveys with higher response rates. These comparisons are valuable, but any differences might be due to a variety of causes other than nonresponse and noncoverage. For example, different questionnaire wordings, modes, and context effects could be responsible for differences. The source of the difference is important because remedial actions (such as using frames that cover a higher proportion of the population) might not have any effect on the differences due to these other sources.

Another nonresponse bias approach used a multivariate Chi-Square Automatic Interaction Detection (CHAID) analysis to detect differences in response rates among subgroups (described in chapter 5). These results were evaluated for consistency between years. A limitation of this approach is that it only provides indicators of potential nonresponse bias rather than direct estimates.

In addition, an extensive evaluation of nonresponse bias was performed for the NHES:2001 (Montaquila et al. 2008). The goal of that research was to investigate nonresponse bias in the estimates if the survey had used different data collection procedures that would have resulted in lower response rates. A limitation of this analysis is that the evaluation was limited to the original set of respondents. Through such studies, researchers are able to examine bias due to excluding hard-to-contact or reluctant respondents, thus informing decisions about how much additional effort might be needed to reduce nonresponse bias. On the other hand, direct assessment of nonresponse bias due to cases that did not complete the survey was not possible.

While each of these methods of analyzing bias has its own limitations, it has been encouraging that none of the efforts has indicated nonresponse bias of substantive importance in the estimates. Many of these approaches essentially used different resources and methodologies, so the collective evaluation provides a more robust estimate of the lack of substantively important bias than any one of them alone could. Nevertheless, the falling response and coverage rates in RDD surveys prompted further research into the potential for bias.

The NHES:2007 Bias Study was developed to provide a more direct assessment of nonresponse bias for cases that did not complete the survey by telephone. This study was the first full-scale NHES effort undertaken to follow up with the nonrespondents in the field. The in-field follow-up was successful in yielding additional completes. Of cases that refused the Screener on the telephone, 42 percent completed the Screener in the field.[47] Similarly, 46 percent of telephone maximum call cases and 45 percent of telephone noncontact cases completed the Screener during the in-field follow-up. This study is still limited because survey estimates for the households that did not respond to either the telephone or in-field effort are not available. However, general characteristics of the cases that failed to respond to the field effort were available from the IOF and decennial census. A higher proportion of field respondents than field nonrespondents were found to live in ZIP codes with lower median home values and lower median income deciles. Also, interviewers classified a higher proportion of field respondents as living in working class or poor households, having evidence of children, and being on blocks where no households had signs for private security, compared to field nonrespondents. For the majority of characteristics examined, however, the field respondents were found to be similar to field nonrespondents.

Results from this study suggest that there is no systematic pattern of bias in key statistics from the NHES:2007. A comparison of the fully weighted RDD estimates to Bias Study estimates showed potential for bias in five estimates. The estimated percentages of preschoolers who count to 20 or higher, whose speech is often understandable to a stranger, and who watch two or more hours of TV in a typical weekday were lower for the RDD survey than the Bias Study. The estimates of the percentage of preschoolers whose mother is not in the labor force, as well the percentage of adults who are currently married, were higher for the RDD survey than the Bias Study. However, the majority of estimates evaluated showed no evidence of bias of substantive importance.

In addition to the evaluation of overall bias in the NHES:2007 estimates, the Bias Study also allowed for the estimation of the nonresponse and noncoverage bias components. The NHES:2007

[47] The percentage includes nonhostile refusals only. Hostile refusals were not sent to the field.

estimates were produced using weights that were adjusted for nonresponse and calibrated to population totals—adjustments that are expected to reduce nonresponse and noncoverage bias. The results from the NHES:2007 Bias Study, in concert with the previous bias analyses, suggest that despite the falling response rates, there is no bias of substantive importance in the NHES:2007 estimates due to nonresponse. A comparison of estimates before and after the raking adjustments indicated potential noncoverage biases in some unadjusted SR survey outcome estimates, as well as in some demographic estimates, that were reduced through the weighting process (see section 7.3 for a complete list). While the weighting adjustments appear to have reduced noncoverage bias, the Bias Study analysis did provide evidence of the potential for noncoverage bias in the final estimate of the percentage of preschoolers whose parents' highest educational attainment is beyond a high school diploma. Although estimates of noncoverage bias in other final estimates examined in this study are not of substantive importance as defined for this report, noncoverage bias may become more of an issue in the future as more households drop their landline telephone service.

This page is intentionally blank.

REFERENCES

Aquilino, W.S, and Wright, D.L. (1996). Substance abuse estimates from RDD and area probability samples: Impact of differential screening methods and unit nonresponse. *Public Opinion Quarterly*, *60* (4): 563–573.

Atrostic, B.K., Bates, N., Burt, G., and Silberstein, A. (2001). Nonresponse in U.S. Government Household Surveys: Consistent Measures, Recent Trends, and New Insights. *Journal of Official Statistics*, *17*: 209–226.

Bethlehem, J. (1988). Reduction of Nonresponse Bias Through Regression Estimation. *Journal of Official Statistics*, *4*: 251–260.

Blenk, D.K., and Stasny, E. (2001). Using Propensity Scores to Control Coverage Bias in Telephone Surveys. *Survey Methodology*, *27*: 121–130.

Blumberg, S.J., Luke J.V. Wireless substitution: Early release of estimates from the National Health Interview Survey, July – December 2007. National Center for Health Statistics. Retrieved August 22, 2008 from http://www.cdc.gov/nchs/nhis.htm.

Blumberg, S.J., Luke, J.V., and Cynamon, M.L. (2006). Telephone Coverage and Health Survey Estimates: Evaluating the Need for Concern about Wireless Substitution. American Journal of Public Health, *96*(5): 926–931.

Boyle, F.M., Cook, M.D., Dunne, M.P., Najman, J.M., and Purdie, D.M. (2002). Health and Demographic Characteristics of Respondents in an Australian National Sexuality Survey: Comparison with Population Norms. *Journal of Epidemiology and Community Health, 56*: 748–753.

Bradburn, N.M. (1983). Response Effects. In P.H. Rossi, J.D. Wright, and A.B. Anderson (Eds.), *Handbook of Survey Research*. Orlando, FL: Academic Press.

Brick, J.M. (1996). *Undercoverage Bias in Estimates of Characteristics of Adults and 0- to 2-Year-Olds in the 1995 National Household Education Survey (NHES:95)* (NCES 96-29). National Center for Education Statistics Working Paper, U.S. Department of Education. Washington, DC.

Brick, J.M., Burke, J., and West, J. (1992). *Telephone Undercoverage Bias of 14- to 21-Year-Olds and 3- to 5-Year-Olds* (NCES 92-101). National Center for Education Statistics, U.S. Department of Education. Washington, DC.

Brick, J.M., and Collins, M. (1997). *An Overview of Response Rates in the National Household Education Survey: 1991, 1993, 1995, and 1996* (NCES 97-948). National Center for Education Statistics, U.S. Department of Education. Washington, DC.

Brick, J.M., Collins, M., and Chandler, K. (1997). *An experiment in random-digit-dial screening* (NCES 98-255). National Center for Education Statistics, U.S. Department of Education. Washington, DC.

Brick, J.M., and Kalton, G. (1996). Handling Missing Data in Survey Research. *Statistical Methods in Medical Research*, *5*: 215–238.

Brick, J.M., Montaquila, J., Hagedorn, M.C., Roth, S.B., and Chapman, C. (2005). Implications for RDD Design From an Incentive Experiment. *Journal of Official Statistics, 21:* 571–589.

Brick, J.M., Tubbs, E., Collins, M.A., Nolin, M.J., Cantor, D., Levin, K., and Carres, Y. (1997). *Telephone Coverage Bias and Recorded Interviews in the 1993 National Household Education Survey (NHES:93)* (NCES 97-02). National Center for Education Statistics, U.S. Department of Education. Washington, DC.

Cochran, W. (1977). *Sampling Techniques (3rd edition)*. New York: John Wiley & Sons.

Cohen, G., and Duffy, J.C. (2002). Are Nonrespondents to Health Surveys Less Healthy Than Respondents? *Journal of Official Statistics*, *18*: 13–23.

Colombo, R. (2000). A Model for Diagnosing and Reducing Nonresponse Bias. *Journal of Advertising Research*, *40*(1/2): 85–93.

Curtin, R., Presser, S., and Singer, E. (2005). Changes in Telephone Survey Nonresponse Over the Past Quarter Century. *Public Opinion Quarterly, 69*: 87–98.

Deming, W.E., and Stephan, F.F. (1940). On a Least Square Adjustment of a Sampled Frequency Table When the Expected Marginal Totals Are Known. *Annals of Mathematical Statistics*, *11*: 427–444.

Deville, C., and Särndal, C. (1992). Calibration Estimators in Survey Sampling. *Journal of the American Statistical Association*, *87*: 376–382.

Garretsen, H.F., Jansen, H.A., Lahaut, V.M., and van de Mheen, D. (2002). Non-Response Bias in a Sample Survey on Alcohol Consumption. *Alcohol & Alcoholism, 37*: 256–260.

Groves, R.M. (1989). *Survey Errors and Survey Costs*. New York: John Wiley & Sons, Inc.

Groves, R., Presser, S., and Dipko, S. (2004). The Role of Topic Interest in Survey Participation Decisions. *Public Opinion Quarterly*, *68*: 2–31.

Groves, R.M., Singer, E., and Corning, A.D. (1999). Leverage-saliency Theory of Survey Participation: Description and an Illustration. *Public Opinion Quarterly*, *64*: 299–308.

Hagedorn, M., Montaquila, J., Carver, P., O'Donnell, K., and Chapman, C. (2006). *National Household Education Surveys Program of 2005: Public-Use Data File User's Manual, Volume I, Study Overview and Methodology* (NCES 2006-078). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

Hagedorn, M., Roth, S.B., O'Donnell, K., Smith, S., and Mulligan, G. (2008). *National Household Education Surveys of 2007: Data File User's Manual, Volume I* (NCES 2009-024). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

Hox, J.J., and De Leeuw, E.D. (1994). A comparison of nonresponse in mail, telephone, and face-to-face surveys. *Quality and Quantity*, *28*(4): 329–344.

Kalton, G., and Maligalig, D. (1991). A Comparison of Methods of Weighting Adjustment for Nonresponse. *Proceedings of the U.S. Bureau of the Census 1991 Annual Research Conference*, 409–428.

Keeter, S., Miller, C., Kohut, A., Groves, R., and Presser, S. (2000). Consequences of Reducing Nonresponse in a Large National Telephone Survey. *Public Opinion Quarterly*, *64*: 125–148.

Leon, J.J., Brown, W.C., Ruch, L.O., Johnson, T.E. (2003). *Survey Research: In-person, Mail, Telephone, and Web Methods*. Honolulu, HI: Streamline Surveys, Inc.

Little, R. (1986). Survey Nonresponse Adjustments for Estimates of Means. *International Statistical Review*, *54*: 139–157.

Lundstrom, S., and Särndal, C-E. (1999). Calibration as a Standard Method for Treatment of Nonresponse. *Journal of Official Statistics*, *15*: 305–327.

Montaquila, J.M., Brick, M.J., and Brock, S.P. (1997). *Working Paper: Undercoverage Bias in Estimates of Characteristics of Households and Adults in the 1996 National Household Education Survey* (NCES 97-39). National Center for Education Statistics, U.S. Department of Education. Washington, DC.

Montaquila, J.M., Brick, J.M., Hagedorn, M.C., Kennedy, C., and Keeter, S. (2008). Aspects of nonresponse bias in RDD telephone surveys. In *Advances in Telephone Survey Methodology* (Lepkowski, J.M., Tucker, C., Brick, J.M., de Leeuw, E.D., Japec, L., Lavrakas, P.J., Link, M.W., and Sangster, R.L., eds.). Hoboken, NJ: John Wiley & Sons, Inc.

Nolin, M.J., Montaquila, J., Nicchitta, P., Hagedorn, M.C., and Chapman, C. (2004). *National Household Education Surveys Program: 2001: Methodology Report* (NCES 2005-071). National Center for Education Statistics, Institute for Education Sciences, U.S. Department of Education. Washington, DC.

Nolin, M.J., Montaquila, J., Nicchitta, P., Kim, K., Kleiner, B., Lennon, J., Chapman, C., Creighton, S., and Bielick, S. (2000). *National Household Education Survey of 1999: Methodology Report*. (NCES 2000-078). National Center for Education Statistics, U.S. Department of Education. Washington, DC.

Office of Management and Budget. (2006). Questions and Answers When Designing Surveys for Information Collection, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C.

O'Muircheartaigh, C., Eckman, S., and Weiss, C. (2002). Traditional and enhanced field listing for probability sampling. *Proceedings of the Social Statistics Section of the American Statistical Association* (pp. 2563–2567).

Roth, S.B., Montaquila, J.M., and Chapman, C. (2007). *Nonresponse Bias in the 2005 National Household Education Surveys Program* (NCES 2007-016). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

Seastrom, M.M. (2002). *NCES Statistical Standards* (NCES 2003-601). National Center for Educatoin Statistics, U.S. Department of Education. Washington, DC.

Smith, P., Hoaglin, D., Rao, J.N.K., Battaglia, M., and Daniels, D. (2004). Evaluation of Adjustments for Partial Non-Response Bias in the US National Immunization Survey. *Journal of the Royal Statistical Society*, *A, 167*: 141–156.

Tucker, C., Brick, J.M., Meekins, B., and Morganstein, D. (2004). Household telephone service and usage patterns in the U.S. in 2004. *Proceedings of the Survey Research Methods Section, American Statistical Association* (CD-ROM).

Tucker, C., Lepkowski, J.M., and Piekarski, L. (2002). The current efficiency of list-assisted telephone sampling designs. *Public Opinion Quarterly*, *66*: 321–338.

Westat (2004). *Field test of the 2005 National Household Education Surveys Program.* Contractor report. Rockville, MD: Westat.

Wolter, K. (1985). *Introduction to Variance Estimation,* Chapter 4. New York: Springer-Verlag.

Appendix A

Advance, Refusal, and Community Letters

This page is intentionally blank.

U.S. DEPARTMENT OF EDUCATION
INSTITUTE OF EDUCATION SCIENCES

NATIONAL CENTER FOR EDUCATION STATISTICS

December, 2006

Dear Sir or Madam:

The National Center for Education Statistics, part of the United States Department of Education, needs your help with an important education research study. The National Household Education Surveys Program (NHES) will be conducted in households all over the country to learn about educational experiences of both adults and children—important issues we can only learn about by speaking with people like you. We have enclosed a token of our appreciation.

Your participation in this research study will help us learn about

- The early educational experiences of young children and how families prepare for children to start school;
- The ways the parents and families are involved in children's education at school and at home, and how schools work with families; and
- Types of education and training that adults may take part in.

Our study uses a scientific sample of households in the country. Some households were selected from among all possible telephone numbers and some were selected from address lists. Your household represents thousands of other households. Even if there are no children or adults who have taken part in educational activities in your household, it is important that we talk to you so that the study results accurately reflect the experiences of all children and adults across the nation.

Please be assured that all information you give is completely confidential and will never be published with your name. More details about the interviews, how your household was selected, and how to obtain reports from previous surveys are provided on the back of this letter.

Westat, a social science research firm, will conduct this study. An interviewer will call you sometime between January 2 and April 1, 2007. A few initial questions will determine if someone in your household is selected for an interview. If we happen to call at an inconvenient time, please suggest a time that is better for you. If you would like to set an appointment before we call, you can contact Westat at their toll-free number (1-888-696-5670) and give your telephone number and the time that is convenient for you.

Please help us in our efforts to better understand education in the United States. We recognize that you have many demands on your time, and we thank you in advance for your cooperation in this important research.

Sincerely,

Gail M. Mulligan

Gail Mulligan
Project Officer
National Household Education Surveys Program

WASHINGTON, D.C. 20006

Some Frequently Asked Questions about the National Household Education Surveys Program (NHES)

Q. How will the study results be used? What will you do with this information?

A. The information we collect will be used to better understand educational experiences and needs. Findings will be published in U.S. Department of Education reports. Reports from NHES surveys are available online at http://nces.ed.gov/nhes or by writing to the National Center for Education Statistics at the address below. The NHES reports, which do not reveal individual answers but rather grouped data for large numbers of people, are widely distributed to educators, researchers, policy makers, news organizations, and the general public.

Q. How did you get my phone number and address?

A. Our study uses a random sample of households in the country. Some households were selected from among all possible telephone numbers and some were selected from address lists. We do not use telephone directories to select telephone numbers. If your number was unlisted, it still is.

Once our sample was selected, an independent organization matched a list of published addresses and phone numbers. This letter was sent to every address that was matched with a telephone number. Address information is kept confidential and will be destroyed as soon as the data collection is completed.

Q. Will you keep my information confidential?

A. All information you give to the interviewer will be kept completely confidential. Employees of the U.S. Department of Education and Westat who are working on this study are required by law to protect the confidentiality of respondents. Your responses will be protected to the fullest extent allowable under law. Also, individual responses are never published in reports; they are combined with the responses of others and are published as grouped data only.

Q. How long will the survey take?

A. First, there are a few short questions to see if any members of your household qualify for the study. They take about 4 minutes. In about half of all households, no one is selected for an interview. If someone is chosen for an interview, it will take approximately 15 to 30 minutes, on average, depending on the interview.

Q. What is the authority for conducting this survey?

A. This study has been approved by the Office of Management and Budget, the office that reviews all federally sponsored surveys. The approval number assigned to this study is 1850-0768. You may send any comments about this survey, including its length, to the Federal Government. Write to Gail Mulligan, National Center for Education Statistics, U.S. Department of Education, 1990 K Street NW, Room 9065, Washington, DC 20006-5650. You may send e-mail to nhes@ed.gov.

U.S. DEPARTMENT OF EDUCATION
INSTITUTE OF EDUCATION SCIENCES

NATIONAL CENTER FOR EDUCATION STATISTICS

February, 2007

Dear Sir or Madam:

Recently, a professional telephone interviewer called your household for a national research study about education. The 2007 National Household Education Surveys Program (NHES) is sponsored by the National Center for Education Statistics, part of the United States Department of Education. As of the date we mailed this letter, we had not completed an interview with your household. You may have already received a letter from me introducing NHES. I am writing to give you more information about the study. I hope that after reading it, you will take part in this important research effort. We have enclosed a token of our appreciation.

The purpose of this research is to learn about the educational experiences of both adults and children. We can only learn about these issues by speaking to families like yours. Your participation in the 2007 NHES will help us learn about

- The early educational experiences of young children and how families prepare for children to start school;
- The ways the parents and families are involved in children's education at school and at home, and how schools work with families; and
- Types of education and training that adults may take part in.

Our study uses a scientific sample of households in the country. Some households were selected from among all possible telephone numbers and some were selected from address lists. Your household represents thousands of other households. Even if no one in your household has taken part in educational activities, it is important that we talk to you so that the study results can reflect the experiences of all children and adults across the nation. Please be assured that the information you provide is completely confidential and will never be given out with your name.

Westat, a social science research firm, is conducting this study. In the next week or two, an interviewer from Westat will call your household again. If we happen to call at an inconvenient time, please suggest a time that is better for you. If you would like to set an appointment before we call, you can contact Westat at their toll-free number (1-888-696-5670) and give your telephone number and the time that is convenient for you.

We know that you have many demands on your time, and we thank you in advance for your help in this important research effort to better understand education in the United States.

Sincerely,

Gail M. Mulligan

Gail Mulligan
Project Officer
National Household Education Surveys Program

WASHINGTON, D.C. 20006

Some Frequently Asked Questions about the National Household Education Surveys Program (NHES)

Q. How will the study results be used? What will you do with this information?

A. The information we collect will be used to better understand educational experiences and needs. Findings will be published in U.S. Department of Education reports. Reports from NHES surveys are available online at http://nces.ed.gov/nhes or by writing to the National Center for Education Statistics at the address below. The NHES reports, which do not reveal individual answers but rather grouped data for large numbers of people, are widely distributed to educators, researchers, policy makers, news organizations, and the general public.

Q. How did you get my phone number and address?

A. Our study uses a random sample of households in the country. Some households were selected from among all possible telephone numbers and some were selected from address lists. We do not use telephone directories to select telephone numbers. If your number was unlisted, it still is.

Once our sample was selected, an independent organization matched a list of published addresses and phone numbers. This letter was sent to every address that was matched with a telephone number. Address information is kept confidential and will be destroyed as soon as the data collection is completed.

Q. Will you keep my information confidential?

A. All information you give to the interviewer will be kept completely confidential. Employees of the U.S. Department of Education and Westat who are working on this study are required by law to protect the confidentiality of respondents. Your responses will be protected to the fullest extent allowable under law. Also, individual responses are never published in reports; they are combined with the responses of others and are published as grouped data only.

Q. How long will the survey take?

A. First, there are a few short questions to see if any members of your household qualify for the study. They take about 4 minutes. In about half of all households, no one is selected for an interview. If someone is chosen for an interview, it will take approximately 20 to 35 minutes, on average, depending on the interview.

Q. What is the authority for conducting this survey?

A. This study has been approved by the Office of Management and Budget, the office that reviews all federally sponsored surveys. The approval number assigned to this study is 1850-0768. You may send any comments about this survey, including its length, to the Federal Government. Write to Gail Mulligan, National Center for Education Statistics, U.S. Department of Education, 1990 K Street NW, Room 9065, Washington, DC 20006-5650. You may send e-mail to nhes@ed.gov.

Q. I got a letter earlier. Why did I get another letter?

A. Sometimes letters do not get delivered or are not read for a number of reasons. This letter is sent to assure that someone in your household has a chance to read information about the study.

U.S. DEPARTMENT OF EDUCATION
INSTITUTE OF EDUCATION SCIENCES

NATIONAL CENTER FOR EDUCATION STATISTICS

March, 2007

Dear Sir or Madam:

The National Center for Education Statistics, part of the United States Department of Education, needs your help with an important education research study. The National Household Education Surveys Program (NHES) will be conducted in households all over the country to learn about the educational experiences of both adults and children—important issues we can only learn about by speaking with people like you.

Your participation in this research study will help us learn about

- The early educational experiences of young children and how families prepare for children to start school;
- The ways that parents and families are involved in children's education at school and at home, and how schools work with families; and
- Types of education and training that adults may take part in.

Your household was selected for the study as part of a scientific random sample of all households in your area, and another household cannot be substituted for yours. Your household represents thousands of other households. Even if there are no children or adults who have taken part in educational activities in your household, it is important that we talk to you so that the study results accurately reflect the experiences of all children and adults across the nation.

Please be assured that all information you give is completely confidential and will never be published with your name. More details about the interviews, how your household was selected, and how to obtain reports from previous surveys are provided on the back of this letter.

Westat, a social science research firm, will conduct this study. An interviewer with a Westat badge will visit your household sometime between March 18 and June 10, 2007. A few initial questions will determine if someone in your household is selected for an interview. If we happen to visit at an inconvenient time, please suggest a time that is better for you. If you would like to set an appointment or complete the interview by telephone before we visit, you can contact Westat at their toll-free number (1-888-696-5670) and give your telephone number and the time that is convenient for you.

Please help us in our efforts to better understand education in the United States. We recognize that you have many demands on your time, and we thank you in advance for your cooperation in this important research.

Sincerely,

Gail M. Mulligan

Gail Mulligan
Project Officer
National Household Education Surveys Program

WASHINGTON, D.C. 20006

Some Frequently Asked Questions about the National Household Education Surveys Program (NHES)

Q. How will the study results be used? What will you do with this information?

A. The information we collect will be used to better understand educational experiences and needs. Findings will be published in U.S. Department of Education reports. Reports from NHES surveys are available online at http://nces.ed.gov/nhes or by writing to the National Center for Education Statistics at the address below. The NHES reports, which do not reveal individual answers but rather grouped data for large numbers of people, are widely distributed to educators, researchers, policy makers, news organizations, and the general public.

Q. How did you select my household for the study?

A. NHES uses scientific sampling methods to select households for the study. Households were selected by drawing addresses from residential addresses in your area. Where possible we matched addresses with telephone numbers so that we can conduct as many interviews as possible by telephone, which is less expensive than in-person interviewing.

Because we were unable to match your address with a phone number, an interviewer will be coming to visit your household between March 18 and June 10, 2007.

Q. Will you keep my information confidential?

A. All information you give to the interviewer will be kept completely confidential. Employees of the U.S. Department of Education and Westat who are working on this study are required by law to protect the confidentiality of respondents. Your responses will be protected to the fullest extent allowable under law. Also, individual responses are never published in reports; they are combined with the responses of others and are published as grouped data only.

Q. How long will the survey take?

A. First, there are a few short questions to see if any members of your household qualify for the study. They take about 5 minutes. In about half of all households, no one is selected for an interview. If someone is chosen for an interview, it will take approximately 15 to 30 minutes, on average, depending on the interview.

Q. What is the authority for conducting this survey?

A. This study has been approved by the Office of Management and Budget, the office that reviews all federally sponsored surveys. The approval number assigned to this study is 1850-0768. You may send any comments about this survey, including its length, to the Federal Government. Write to Gail Mulligan, National Center for Education Statistics, U.S. Department of Education, 1990 K Street NW, Room 9065, Washington, DC 20006-5650. You may send e-mail to nhes@ed.gov.

U.S. DEPARTMENT OF EDUCATION
INSTITUTE OF EDUCATION SCIENCES

NATIONAL CENTER FOR EDUCATION STATISTICS

(Month), 2007

Dear Sir or Madam:

Recently, a professional interviewer visited your household for a research study about education. The National Household Education Surveys Program (NHES) is sponsored by the National Center for Education Statistics, part of the United States Department of Education. As of the date we mailed this letter, we had not completed an interview with your household. You may have already received a letter from me introducing NHES. I am writing to give you more information about the study. I hope that after reading it, you will take part in this important research effort.

The purpose of this research is to learn about the educational experiences of both adults and children. We can only learn about these issues by speaking to families like yours. Your participation in the NHES will help us learn about

- The early educational experiences of young children and how families prepare for children to start school;
- The ways that parents and families are involved in children's education at school and at home, and how schools work with families; and
- Types of education and training that adults may take part in.

Your household was selected for the study as part of a scientific random sample of households and another household cannot be substituted for yours. Your household represents thousands of other households. Even if no one in your household has taken part in educational activities, it is important that we talk to you so that the study results can reflect the experiences of all children and adults. Please be assured that the information you provide is completely confidential and will never be given out with your name.

Westat, a social science research firm, is conducting this study. In the next week or two, an interviewer from Westat will visit your household again. If we happen to stop by at an inconvenient time, please suggest a time that is better for you. If you would like to set an appointment before we call, you can contact Westat at their toll-free number (1-888-696-5670) and give your telephone number and the time that is convenient for you.

We know that you have many demands on your time, and we thank you in advance for your help in this important research effort to better understand education in the United States.

Sincerely,

Gail M. Mulligan

Gail Mulligan
Project Officer
National Household Education Surveys Program

Some Frequently Asked Questions about the National Household Education Surveys Program (NHES)

Q. How will the study results be used? What will you do with this information?

A. The information we collect will be used to better understand educational experiences and needs. Findings will be published in U.S. Department of Education reports. Reports from NHES surveys are available online at http://nces.ed.gov/nhes or by writing to the National Center for Education Statistics at the address below. The NHES reports, which do not reveal individual answers but rather grouped data for large numbers of people, are widely distributed to educators, researchers, policy makers, news organizations, and the general public.

Q. How did you select my household for the study?

A. NHES uses scientific sampling methods to select households for the study. Households were selected by drawing addresses from residential addresses in your area. Where possible we matched addresses with telephone numbers so that we can conduct as many interviews as possible by telephone, which is less expensive than in-person interviewing.

Because we were unable to match your address with a phone number, an interviewer will be coming to visit your household between March 18 and June 10, 2007.

Q. Will you keep my information confidential?

A. All information you give to the interviewer will be kept completely confidential. Employees of the U.S. Department of Education and Westat who are working on this study are required by law to protect the confidentiality of respondents. Your responses will be protected to the fullest extent allowable under law. Also, individual responses are never published in reports; they are combined with the responses of others and are published as grouped data only.

Q. How long will the survey take?

A. First, there are a few short questions to see if any members of your household qualify for the study. They take about 5 minutes. In about half of all households, no one is selected for an interview. If someone is chosen for an interview, it will take approximately 15 to 30 minutes, on average, depending on the interview.

Q. What is the authority for conducting this survey?

A. This study has been approved by the Office of Management and Budget, the office that reviews all federally sponsored surveys. The approval number assigned to this study is 1850-0768. You may send any comments about this survey, including its length, to the Federal Government. Write to Gail Mulligan, National Center for Education Statistics, U.S. Department of Education, 1990 K Street NW, Room 9065, Washington, DC 20006-5650. You may send e-mail to nhes@ed.gov.

Q. I got a letter earlier. Why did I get another letter?

A. Sometimes letters do not get delivered or are not read for a number of reasons. This letter is sent to assure that someone in your household has a chance to read information about the study. We are sending this by FedEx at the special low rate available to the government in order to bring this important study to your attention.

March, 2007

Dear Sir or Madam:

The bearer of this letter is a professionally trained interviewer working on the National Household Education Surveys Program (NHES) for the National Center for Education Statistics (NCES), which is part of the United States Department of Education. The interviewer is an employee of Westat, which was contracted by NCES to conduct this study.

The interviewer is contacting designated households to gather important information about the educational experiences of adults and children. All households selected for this education research study have received a letter from the U.S. Department of Education explaining the project. The householder may decide if he or she wishes to participate.

If you receive an inquiry from a concerned citizen, please assure that person of the legitimacy of the interviewer's work. All interviewers working on this project have a photo identification badge. You may contact me at (202) 502-7491, or Westat at 1-888-696-5670, if you have any questions.

Sincerely,

Gail M. Mulligan

Gail Mulligan
Project Officer
National Household Education Surveys Program

This page is intentionally blank.

Appendix B

Household Folder

This page is intentionally blank.

National Household Education Surveys Program (NHES)

HOUSEHOLD FOLDER

ADDRESS	
	ADDRESS DISPOSITIONS (circle one) CA ..... Correct address CF ..... Correct with minor change UC .... Unable to confirm address NF ..... Not Found NE ..... No Entry NO Other (EXPLAIN)

1. INTRODUCTION:

Hello, I'm (NAME) with Westat, a social science research company located in Maryland. Here is my ID badge (SHOW BADGE). I am working on the National Household Education Surveys Program. This is a research study sponsored by the United States Department of Education to learn about educational experiences of both adults and children.
(**ASK IF NOT OBVIOUS**: Are you a member of this household and at least 18 years old?)

YES GIVE THE ADVANCE LETTER AND BROCHURE

NO IF NO, ASK FOR HH MEMBER 18 OR OLDER (HEAD OF HH IF NON 18+)
IF NO ADULT/HEAD OF HH AVAILABLE, SET APPOINTMENT AND END.

2. First I need to verify that I am at the correct address. Is this (LABEL ADDRESS)?

1. YES **(GO TO Q3)**
2. YES with minor change **(GO TO Q3)**
3. NO ADDRESS MATCH **(GO TO Q5)**

3. Is (LABEL TELEPHONE NUMBER) a telephone number in this household?

1. YES (**GO TO Q4**)
2. NO (**GO TO Q4**)

4. CORRECT ADDRESS LOCATED:

As I said, this research study is sponsored by the United States Department of Education, and is concerned with the education of both children and adults. Interviews are being conducted by our professionally trained interviewing staff in Rockville, MD. We can call them toll-free on your phone or use this cell phone.

First, a few questions about the people in your household will identify anyone who is eligible for an interview. We are offering $20 to those households that complete this initial screening interview. After those initial questions are done, you or another member of your household may be selected for an interview.

(GO TO PAGE 3)

5. IF ADDRESS IS NOT A MATCH:

THANK RESPONDENT:

Thank you, that's all the information that I need. We have the wrong address so we will not be asking you for an interview.

SETTING AN APPOINTMENT

IF HH MEMBER AT LEAST 18 YEARS OLD IS NOT AVAILABLE OR IF RESPONDENT CANNOT DO THE INTERVIEW NOW, SET APPOINTMENT TO RETURN.

When would be a good time for me to return so that we can conduct the interview with (you/NAME)?

APPOINTMENT WITH:

_____

DATE: _____ TIME: _____ AM/PM

LEAVE APPOINTMENT CARD WITH HOUSEHOLD

NOTE: REMEMBER TO MAKE CALL RECORD ENTRIES ON PAGE 4 AND GIVE ADDRESS LABEL A DISPOSITION CODE.

IF ADDRESS IS CORRECT, MAKE TELEPHONE CORRECTIONS ON LABEL, IF APPLICABLE.

MAKING CONTACT WITH THE TRC

IF USING THE HOUSEHOLD'S TELEPHONE – I will place the call to 1-888-696-5672, which is a toll free number at the interviewing center. When the supervisor answers, I will give her some information (I will give the supervisor your telephone number in case we are disconnected. [GAIN PHONE NUMBER IF IT IS NOT LISTED ON THE LABEL]). After that, I will hand the telephone to you and the interviewer will ask you a few questions about the people in your household. Once that is completed the interviewer will ask to speak to me once more. I will give the phone back to you or let you know if another member of your household is selected. Then I will leave and you may continue the interview in private.

IF USING THE CELLULAR TELEPHONE – To ensure good telephone reception, let's sit close to a window or outside. I will place the call to 1-888-696-5672, which is a toll free number at the interviewing center. When the supervisor answers, I will give her some information. After that, I will hand the telephone to you and the interviewer will ask you a few questions about the people in your household. If the call becomes disconnected or if static or other interference interrupts the interview, please hand the telephone back to me. Please do not turn off the power or push any buttons during the interview. At the end of the initial questions about your household, the interviewer will ask to speak to me again. After that, I will hand the telephone back to you so that you may continue the interview, or let you know if another household member is chosen.

INTERVIEWER INSTRUCTIONS: WHEN THE TRC SUPERVISOR ANSWERS, PROVIDE HER WITH YOUR NAME AND THE IDENTIFICATION NUMBER ON THE LABEL. REMIND TRC INTERVIEWER TO ASK FOR YOU ONCE THE SCREENER IS COMPLETED. ONCE THE CALL HAS BEEN TRANSFERRED TO A TRC INTERVIEWER, HAND THE TELEPHONE TO THE RESPONDENT.

SPANISH SPEAKING HOUSEHOLD: IF YOU ENCOUNTER A HOUSEHOLD WHERE SPANISH IS THE ONLY LANGUAGE SPOKEN, AND YOU ARE NOT A SPANISH SPEAKING INTERVIEWER, ASK FOR AN ENGLISH-SPEAKING HOUSEHOLD MEMBER. IF AN ENGLISH-SPEAKING HOUSEHOLD MEMBER, AGE 18 YEARS OR OLDER IS AVAILABLE, PROCEED WITH INTERVIEW. IF NO ENGLISH SPEAKING HOUSEHOLD MEMBER IS AVAILABLE, AND YOU ARE UNABLE TO COMMUNICATE WITH THE HOUSEHOLD, TRY TO CONFIRM WITH SOMEONE IN THE HOUSEHOLD THAT THE ADDRESS (AND TELEPHONE NUMBER, IF ONE IS PRESENT) PRINTED ON THE LABEL IS CORRECT. THANK THE RESPONDENT AND THEN CONTACT YOUR SUPERVISOR.

CALL RECORD

DATE	DAY OF WEEK	TIME	RESULT	HOME/CELL (CIRCLE ONE ON DATE CASE IS FINALIZED)	COMMENTS	DU TYPE
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		

DU STRUCTURE TYPE

SA..... Stand alone home

TH..... Town home/Duplex

AP..... Apartment, Flat

OS ... Other

INTERIM CODES (for Screeners only)

1..... Not home/no answer
2..... Refusal/breakoff
4..... Appointment
6..... Language problem
7..... No entry
8..... Other

FINAL CODES

C1.....Complete, screener, no eligibles
C2.....Complete, field screener and extended complete
C3.....Complete, field screener, 1 or more extended interview outstanding
RB .....Refusal/breakoff
MC.....Maximum calls
LP.....Language Problem
NE .....No Entry
NF .....Not Found
NV .....Vacant/demolished/condemned
ND .....Not a DU
NO.....Other

Programa Nacional de Encuestas en Hogares sobre Educación (NHES)

HOUSEHOLD FOLDER

ADDRESS	
	ADDRESS DISPOSITIONS (circle one) CA .... Correct address CF..... Correct with minor change UC ... Unable to confirm address NF..... Not Found NE .... No Entry NO Other (EXPLAIN)

1. INTRODUCTION:

Buenos días/Buenas tardes, mi nombre es (NAME) y trabajo para Westat, una firma localizada en Maryland que realiza investigación en el área de las ciencias sociales. Esta es mi identificación (SHOW BADGE). Estoy trabajando para el Programa Nacional de Encuestas en Hogares sobre Educación. Este es un estudio patrocinado por el Departamento de Educación de los Estados Unidos para recoger información acerca de las experiencias educativas de adultos y niños. (**ASK IF NOT OBVIOUS**: ¿Es usted miembro de este hogar y tiene por lo menos 18 años de edad?)

YES GIVE THE ADVANCE LETTER AND BROCHURE

NO IF NO, ASK FOR HH MEMBER 18 OR OLDER (HEAD OF HH IF NON 18+)
IF NO ADULT/HEAD OF HH AVAILABLE, SET APPOINTMENT AND END.

2. Primero, necesito verificar que estoy en la dirección correcta. ¿Es esta (LABEL ADDRESS)? 1. YES **(GO TO Q3)** 2. YES with minor change **(GO TO Q3)** 3. NO ADDRESS MATCH **(GO TO Q5)**	**3.** ¿Es (LABEL TELEPHONE NUMBER) un número de teléfono en esta casa? 3. YES (**GO TO Q4**) 4. NO (**GO TO Q4**)

4. CORRECT ADDRESS LOCATED:

Tal como mencioné, este estudio de investigación es patrocinado por el Departamento de Educación de los Estados Unidos, y se trata sobre la educación de niños y adultos. Las entrevistas son realizadas por nuestro personal entrenado profesionalmente en Rockville, MD. Podemos llamarlos gratis en su teléfono o usar este celular.

Primero, hay unas preguntas acerca de las personas en su hogar para ver si hay alguien que cumple con los requisitos para una entrevista. Estamos ofreciendo $20 a los hogares que completan esta entrevista inicial. Después que terminemos con esas preguntas, usted u otro miembro de su hogar puede ser elegido para ser entrevistado. **(GO TO PAGE 3)**

5. IF ADDRESS IS NOT A MATCH:

THANK RESPONDENT:
Muchas gracias, esa es toda la información que necesito. La dirección que tenemos no es correcta, así es que no le pediré una entrevista.

SETTING AN APPOINTMENT

IF HH MEMBER AT LEAST 18 YEARS OLD IS NOT AVAILABLE OR IF RESPONDENT CANNOT DO THE INTERVIEW NOW, SET APPOINTMENT TO RETURN.

¿Cuándo sería conveniente que yo regresara para hacer la entrevista con (usted/NAME)?

APPOINTMENT WITH:

_____

DATE: _____ TIME: _____ AM/PM

LEAVE APPOINTMENT CARD WITH HOUSEHOLD

NOTE: REMEMBER TO MAKE CALL RECORD ENTRIES ON PAGE 4 AND GIVE ADDRESS LABEL A DISPOSITION CODE.

IF ADDRESS IS CORRECT, MAKE TELEPHONE CORRECTIONS ON LABEL, IF APPLICABLE.

MAKING CONTACT WITH THE TRC

IF USING THE HOUSEHOLD'S TELEPHONE – Voy a marcar el 1-888-696-5672. Este número es del centro de entrevistas y es una llamada gratis. Cuando la supervisora conteste, le daré alguna información (le daré a la supervisora su número de teléfono en caso que la llamada se desconecte. [GAIN PHONE NUMBER IF IT IS NOT LISTED ON THE LABEL]). Después, le voy a pasar el teléfono a usted y el entrevistador le hará algunas preguntas sobre las personas de su hogar. Una vez que termine, el entrevistador pedirá hablar conmigo de nuevo. Después le voy a pasar a usted el teléfono o le voy a decir si otro miembro de su hogar ha sido elegido. En ese momento me voy a ir para que usted pueda continuar la entrevista en privado.

IF USING THE CELLULAR TELEPHONE – Para asegurarnos que hay buena recepción, sentémonos cerca de una ventana o afuera. Voy a marcar el 1-888-696-5672. Este número es del centro de entrevistas y es una llamada gratis. Cuando la supervisora conteste, le daré alguna información. Después, le voy a pasar el teléfono a usted y el entrevistador le hará algunas preguntas sobre las personas de su hogar. Si la llamada se desconecta o si la entrevista se interrumpe con estática u otra interferencia, por favor páseme el teléfono. Por favor no lo apague ni presione ningún botón durante la entrevista. Una vez que termine las preguntas iniciales sobre su hogar, el entrevistador pedirá hablar conmigo de nuevo. Después le voy a pasar a usted el teléfono para que pueda continuar con la entrevista, o le voy a decir si otro miembro de su hogar ha sido elegido.

INTERVIEWER INSTRUCTIONS: WHEN THE TRC SUPERVISOR ANSWERS, PROVIDE HER WITH YOUR NAME AND THE IDENTIFICATION NUMBER ON THE LABEL. REMIND TRC INTERVIEWER TO ASK FOR YOU ONCE THE SCREENER IS COMPLETED. ONCE THE CALL HAS BEEN TRANSFERRED TO A TRC INTERVIEWER, HAND THE TELEPHONE TO THE RESPONDENT.

SPANISH SPEAKING HOUSEHOLD: IF YOU ENCOUNTER A HOUSEHOLD WHERE SPANISH IS THE ONLY LANGUAGE SPOKEN, AND YOU ARE NOT A SPANISH SPEAKING INTERVIEWER, ASK FOR AN ENGLISH-SPEAKING HOUSEHOLD MEMBER. IF AN ENGLISH-SPEAKING HOUSEHOLD MEMBER, AGE 18 YEARS OR OLDER IS AVAILABLE, PROCEED WITH INTERVIEW. IF NO ENGLISH SPEAKING HOUSEHOLD MEMBER IS AVAILABLE, AND YOU ARE UNABLE TO COMMUNICATE WITH THE HOUSEHOLD, TRY TO CONFIRM WITH SOMEONE IN THE HOUSEHOLD THAT THE ADDRESS (AND TELEPHONE NUMBER, IF ONE IS PRESENT) PRINTED ON THE LABEL IS CORRECT. THANK THE RESPONDENT AND THEN CONTACT YOUR SUPERVISOR.

CALL RECORD

DATE	DAY OF WEEK	TIME	RESULT	HOME/CELL (CIRCLE ONE ON DATE CASE IS FINALIZED)	COMMENTS	DU TYPE
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		
		AM PM		**H C**		

DU STRUCTURE TYPE

SA ..... Stand alone home

TH ..... Town home/Duplex

AP ..... Apartment, Flat

OS .... Other

INTERIM CODES (for Screeners only)

1..... Not home/no answer
2..... Refusal/breakoff
4..... Appointment
6..... Language problem
7..... No entry
8..... Other

FINAL CODES

C1 ..... Complete, screener, no eligibles
C2 ..... Complete, field screener and extended complete
C3 ..... Complete, field screener, 1 or more extended interview outstanding
RB .... Refusal/breakoff
MC .... Maximum calls
LP ..... Language Problem
NE .... No Entry
NF ..... Not Found
NV ..... Vacant/demolished/condemned
ND .... Not a DU
NO .... Other

Appendix C

Interviewer Observation Form (IOF)

This page is intentionally blank.

NHES:2007 INTERVIEWER OBSERVATION FORM

FIELDID: _____ (print or affix label) Interviewer initials: _____

Record date and time IOF was completed: ___/___/___ ___:___ am/pm

Neighborhood Characteristics

IOF1100. How would you characterize the area?

URBANCH

URBAN 1
SUBURBAN 2
RURAL 3

IOF1120. What is the traffic flow on this street?

TRAFFICF

LIGHT 1
MODERATE 2
HEAVY 3

IOF1140. Are there abandoned cars on the street or in the alley or lots nearby?

ABANDCAR

NONE 1
VERY FEW (ROUGHLY 1-2 CARS) 2
SOME (ROUGHLY 3-4 CARS) 3
MANY (ROUGHLY 5 OR MORE CARS) 4

IOF1160. Is there trash or junk on the street or sidewalks, in yards or lots?

TRASHVIS

NONE 1
VERY LITTLE 2
SOME 3
A LOT 4

IOF1180. How would you characterize the land use on this block?

LANDUSE

PRIMARILY RESIDENTIAL (HOUSES AND APARTMENTS) 1
PRIMARILY COMMERCIAL (STORES AND BUSINESSES) 2
PRIMARILY INDUSTRIAL (WAREHOUSES AND FACTORIES) 3
PRIMARILY VACANT LOTS OR UNDEVELOPED SPACE 4
MIXED RESIDENTIAL AND COMMERCIAL 5
MIXED RESIDENTIAL AND INDUSTRIAL 6
MIXED RESIDENTIAL AND VACANT LOTS 7
OTHER 91
SPECIFY _____

IOF1200. How many houses/apartments have window bars or gratings on doors or windows?

SECURBAR

NONE 1
VERY FEW 2
SOME 3
MOST 4
ALL 5

IOF1220. How many houses/apartments have signs indicating they are protected by private security services?

SECURSVC

NONE 1
VERY FEW 2
SOME 3
MOST 4
ALL 5

IOF1240. Are there signs indicating there is a neighborhood watch on this block?

SECURNWT

YES 1
NO 2

IOF1260. Did you see any children (infants/toddlers/children/teenagers) on the block?

CHILDBLK

YES 1
NO 2

IOF1280. Did you hear any language other than English on the block?

OTHLANG

YES 1
NO 2
NO PEOPLE AROUND OR DID NOT HEAR ANY LANGUAGE 3

Household Environment

IOF1400. How would you characterize **this household** based on the home and exterior appearance?

WEALTHHH

AFFLUENT OR UPPER MIDDLE CLASS 1
MIDDLE-MIDDLE CLASS 2
WORKING CLASS OR POOR 3

IOF1420. Is there any evidence of children living in **this household**? [Look for playsets in the yard, children's bicycles or toys, children playing in the yard, etc.]

CHILDHH

YES 1
NO 2

IOF1440. Does **this household** have window bars or gratings on doors or windows?

SECBARHH

YES 1
NO 2

IOF1460. Does **this household** have signs indicating they are protected by private security services?

SECSVCHH

YES 1
NO 2

Appendix D

Sorry I Missed You Card

This page is intentionally blank.

Sorry I Missed You!

Sponsored by:
National Center for Education Statistics
United States Department of Education
nces.ed.gov/nhes

Sorry I Missed You!

I stopped by your home today to talk with you about the **National Household Education Surveys Program** (NHES). This is an important **education research study** sponsored by the **United States Department of Education** and conducted by Westat, a social science research organization.

We are not selling anything!

I will return to speak with you in a few days. If you would like more information or would like to set up an appointment for a confidential interview please contact Westat toll-free at 888-696-5670.

Thank you in advance for your participation!

OMB # 1850-0768

¡Siento no haberle encontrado!

NHES
National Household
Education Surveys Program

Patrocinado por:
Centro Nacional de Estadísticas de Educación
Departamento de Educación de Estados Unidos
nces.ed.gov/nhes

¡Siento no haberle encontrado!

Pasé hoy por su casa para hablar con usted sobre el **Programa Nacional de Encuestas en Hogares sobre Educación** (NHES). Este es un importante **estudio de investigación sobre educación** patrocinado por el **Departamento de Educación de Estados Unidos** y conducido por Westat, una firma de investigación en el área de las ciencias sociales.

¡No vendemos nada!

Regresaré para hablar con usted dentro de unos días. Si desea más información o quisiera programar una cita para hacer una entrevista confidencial, por favor llame a Westat al número gratuito 888-696-5670.

¡De antemano, muchas gracias por su participación!

OMB # 1850-076

Appendix E

Appointment Card

This page is intentionally blank.

National Household
Education Surveys Program

Sponsored by:
National Center for Education Statistics
United States Department of Education

nces.ed.gov/nhes

Appointment Card

I stopped by your home today to talk with you about the National Household Education Surveys Program (NHES). This is an important education research study sponsored by the United States Department of Education and conducted by Westat, a social science research organization.

We are not selling anything!

I will return on: _____

At _____to speak with _____

If it's necessary to change your appointment for a confidential interview or if you would like additional information, please contact Westat at 1-888-696-5670. Or you may contact me at:

_____ _____

Thank you in advance for your participation!

_____

OMB # 1850-0768

Appendix F

Field Non-Interview Report Form (NIRF)

This page is intentionally blank.

_____
Field ID

National Household Education Surveys Program (NHES)
Follow-Up Study

NON-INTERVIEW REPORT FORM (NIRF)

Address: _____

City, State, ZIP: _____

1. To whom did you speak to during your contact attempts:

Name:_____	Name:_____	Name:_____
Age: _____	Age: _____	Age: _____
Sex: _____	Sex: _____	Sex: _____
Race:_____	Race:_____	Race:_____

2. Why were you unable to get a completion?

Language barrier or problem .....1**(Q5)**
Refusal/Breakoff.....2**(Q3)**
Maximum Calls.....3**(Q6)**
Not Found .....4**(Q6)**
No entry .....5**(Q6)**

Other (specify) .....6**(Q6)**
_____

3. IF REFUSAL/BREAKOFF: What reasons were given for the refusal/breakoff? (RECORD EXPLANATION "R" GAVE.]

_____

_____

_____

_____

4.

CODE THE MOST IMPORTANT REASON FOR THE RESPONDENT'S REFUSAL/BREAKOFF. <u>CIRCLE ONLY ONE</u>

Too Busy 1
Too Ill SP/Family Member 2
Not Interested/Didn't want to Participate 3
Doesn't like Survey/Questions 4
Dislikes Government/Waste of Time.....5
Afraid/Told not to Participate/Gatekeeper 6
Confidentiality/No Consent/Voluntary 7
Claimed this Survey did not Apply to Respondent 8
Other Specify _____

GO TO Q6.

5. IF LANGUAGE PROBLEM: Record the language spoken in household.

_____

6. DESCRIBE THE CIRCUMSTANCES OF THE NON-RESPONSE

7. Interviewer: _____

Date: _____

Appendix G

Nonresponse Bias Estimates With Unadjusted Base Weights

This page is intentionally blank.

Table G-1. Unadjusted base weight estimates of nonresponse bias for various characteristics from the School Readiness (SR) Survey: NHES:2007 Bias Study

Characteristic	Reduced treatment SR respondents			Full treatment SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Participation in center-based care	143	54.6	3.34	177	57.1	3.22	-2.5	1.08	-4.4
Specific skills									
Recognizes all colors	207	84.6	1.61	249	85.4	1.55	-0.8	0.57	-0.9
Counts to 20 or higher	165	66.9	2.73	198	67.7	2.42	-0.9	0.77	-1.2
Recognizes all letters	78	30.0	2.33	93	31.0	1.87	-1.0	1.00	-3.2
Writes first name	158	63.1	3.41	193	65.0	3.05	-1.9	0.84	-2.9
Holds a pencil	210	86.9	2.33	252	87.3	1.67	-0.5	0.82	-0.5
Speech is often understandable to a stranger	207	85.7	2.36	249	86.4	1.97	-0.6	0.60	-0.8
Reads or pretends to read storybooks	242	98.9	0.69	289	99.0	0.61	-0.2	0.09	-0.1
Parents believe it is essential to do certain things to prepare child for kindergarten									
Teach child the alphabet	143	57.1	2.62	171	57.6	2.40	-0.4	1.22	-0.9
Teach child about sharing	149	59.4	2.26	177	59.6	2.44	-0.1	0.95	-0.3
Teach child to read	117	48.6	2.78	139	48.4	2.16	0.2	1.45	0.4
Teach child numbers	129	51.4	2.46	155	52.1	2.13	-0.7	1.21	-1.3
Show child how to hold a pencil	99	38.3	3.11	121	39.5	2.44	-1.2	1.14	-3.0
Family member read to child everyday in the past week	145	58.0	3.31	169	57.3	2.75	0.7	0.82	1.2

See notes at end of table.

Table G-1. Unadjusted base weight estimates of nonresponse bias for various characteristics from the School Readiness (SR) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment SR respondents			Full treatment SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents report usually doing certain reading-related activity with child									
Ask child what is in a picture	133	54.6	3.17	159	54.8	3.15	-0.2	1.06	-0.4
Stop reading and point out letters	81	32.8	3.01	95	32.5	2.95	0.3	1.04	0.9
Ask child to read with parent	72	28.7	2.79	84	28.3	2.28	0.5	1.13	1.4
Talk about the story and what happened	140	58.9	3.42	165	58.3	2.81	0.7	1.13	1.0
Parents did home activities with child in the past week[3]	104	41.1	3.32	123	41.2	3.05	0.0	1.22	-0.2
Parents took 3 or more outings with child in the past month[4]	115	48.9	3.15	138	48.9	2.98	0.0	1.21	0.0
Child watches 2 or more hours of TV in a typical weekday	151	68.2	2.62	179	67.1	2.52	1.1	1.27	1.6
Child has a disability	30	13.7	2.85	37	13.6	2.51	0.1	0.67	0.7
Child's age									
3 years	108	42.9	3.44	128	42.2	3.54	0.7	0.99	1.7
4 years	95	37.1	3.47	116	38.5	3.45	-1.3	1.16	-3.6
5 years and older	42	20.0	4.46	48	19.4	3.94	0.6	1.06	3.1
Child's sex									
Male	145	60.0	4.20	169	58.3	3.35	1.7	1.39	2.9
Female	100	40.0	4.20	123	41.7	3.35	-1.7	1.39	-4.1

See notes at end of table.

Table G-1. Unadjusted base weight estimates of nonresponse bias for various characteristics from the School Readiness (SR) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment SR respondents			Full treatment SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Household urbanicity									
Urban	205	83.1	5.89	247	83.9	5.41	-0.7	0.74	-1.0
Rural	40	16.9	5.89	45	16.1	5.41	0.7	0.74	5.0
Home tenure									
Own	165	64.3	3.30	201	65.5	2.92	-1.2	0.86	-1.8
Rent/other	80	35.7	3.30	91	34.5	2.92	1.2	0.86	3.5
Parents' educational attainment									
High school diploma or below	76	34.9	2.80	91	34.2	2.81	0.6	1.10	2.0
Beyond high school diploma	169	65.1	2.80	201	65.8	2.81	-0.6	1.10	-1.1
Parents' language									
Both/only parent(s) speak(s) English	212	86.6	3.28	254	87.6	2.92	-1.0	0.58	-1.1
One of two parents speaks English	‡	‡	‡	‡	‡	‡	‡	‡	‡
No parent speaks English	26	12.5	3.28	29	11.7	2.92	0.9	0.57	6.8
Mothers' employment status									
35 hours or more per week	89	37.4	2.52	111	39.2	2.54	-1.8	0.66	-4.6
Less than 35 hours per week	55	20.9	3.15	69	21.6	2.64	-0.7	0.85	-3.2
Looking for work	23	11.4	2.53	23	9.9	2.24	1.5	0.35	15.2
Not in labor force	74	28.6	3.01	83	27.0	2.67	1.5	0.47	5.9
No mother in household	4!	1.7!	1.13!	6	2.2	0.94	-0.5	0.63	-22.7!

See notes at end of table.

Table G-1. Unadjusted base weight estimates of nonresponse bias for various characteristics from the School Readiness (SR) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment SR respondents			Full treatment SR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Poverty status									
Poor	61	28.6	3.86	80	31.0	3.26	-2.4	1.24	-7.7
Nonpoor	184	71.4	3.86	212	69.0	3.26	2.4	1.24	3.5
Household income									
Less than $15,000	39	18.0	3.11	52	20.1	2.60	-2.1	1.08	-10.4
$15,001 to $30,000	47	20.9	2.86	62	22.1	2.68	-1.2	1.12	-5.4
$30,001 to $50,000	42	16.0	2.85	50	15.9	2.41	0.1	0.87	0.6
More than $50,000	117	45.1	2.89	128	41.9	2.54	3.2	1.40	7.6
Family structure									
Mother and father	187	74.6	5.20	219	73.2	4.48	1.4	1.42	1.9
Mother	49	21.1	4.10	60	21.6	3.30	-0.4	1.42	-2.3
Father	4!	1.7!	1.13!	6	2.2	0.94	-0.5	0.63	-22.7!
Nonparent guardian(s)	5	2.6	1.20	7	3.0	1.28	-0.4	0.51	-13.3

Rounds to zero.
! Interpret with caution.
‡ Reporting standards not met.
[1] Bias is estimated as the difference between the reduced treatment SR respondents estimate and the full treatment SR respondents estimate.
[2] Relative bias is estimated as the bias estimate divided by the full treatment SR respondents estimate, and is expressed as a percentage.
[3] Told child a story; taught child letters, words, or numbers; taught child songs or music; did arts and crafts with child; played sports, active games or exercised together; and played board games or did puzzles with child.
[4] Any 3 or more of the following: Visited a library; visited a bookstore; went to a play, concert, or other live show; visited an art gallery, museum, or historical site; visited a zoo or aquarium; attended an event sponsored by a community, religious, or ethnic group; and attended an athletic or sporting event (outside of school) in which the child was not a player.
SOURCE: U.S. Department of Education, National Center for Education Statistics, School Readiness (SR) Survey of the National Household Education Surveys Program, 2007.

Table G-2. Unadjusted base weight estimates of nonresponse bias for various characteristics from the Parent and Family Involvement in Education (PFI) Survey: NHES:2007 Bias Study

Characteristic	Reduced treatment PFI respondents			Full treatment PFI respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents participate in 5 or more activities in the student's school[3]	478	49.7	1.74	566	50.5	1.59	-0.8	0.57	-1.6
Parents report school provides information very well									
About how student is doing in school	568	59.3	2.48	668	59.5	2.21	-0.3	0.51	-0.3
About how to help student with his/her homework	449	48.5	1.65	525	48.3	1.60	0.2	0.53	0.4
About why student is placed in particular groups or classes	419	45.1	1.89	496	45.6	1.64	-0.5	0.55	-1.1
About how to help student plan for college or vocational school	205	38.4	1.61	237	37.6	1.75	0.8	0.35	2.1
About the family's expected role at student's school	460	48.2	1.68	539	48.2	1.55	0.1	0.41	0.0
Parent reports being very satisfied with 4 or more aspects of the student's school[4]	685	74.1	1.40	798	73.6	1.32	0.5	0.45	0.7
Parents participated in 5 or more home learning activities[5]	194	43.3	2.17	229	43.2	2.01	0.1	0.55	0.2
Parents took 3 or more outings with student in the past month[6]	472	50.3	2.16	559	51.0	1.96	-0.7	0.45	-1.4

See notes at end of table.

Table G-2. Unadjusted base weight estimates of nonresponse bias for various characteristics from the Parent and Family Involvement in Education (PFI) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment PFI respondents			Full treatment PFI respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents check to see that student's homework gets done	748	86.8	1.52	885	87.3	1.34	-0.5	0.36	-0.6
Parents received information about free tutoring	396	42.0	2.25	465	42.4	2.24	-0.4	0.71	-0.9
Parent expects student to earn a college degree or higher	369	68.4	3.02	424	67.8	2.43	0.6	0.93	0.9
Family plans to help pay for student's education after high school	414	83.1	1.91	475	82.4	1.73	0.7	0.68	0.8
Student participated in school activities	531	56.2	2.70	624	56.3	2.42	-0.1	0.58	-0.2
Student has a disability	211	22.4	1.86	257	23.4	1.80	-1.0	0.53	-4.3
Student's sex									
Male	500	51.6	2.00	575	50.8	1.90	0.8	0.39	1.6
Female	459	48.4	2.00	548	49.2	1.90	-0.8	0.39	-1.6
Household urbanicity									
Urban	797	84.0	4.61	933	84.1	4.79	0.0	0.37	-0.1
Rural	162	16.0	4.61	190	15.9	4.79	0.0	0.37	0.6
Home tenure									
Own	708	71.5	1.17	837	72.4	0.97	-0.9	0.59	-1.2
Rent/other	251	28.5	1.17	286	27.6	0.97	0.9	0.59	3.3

See notes at end of table.

Table G-2. Unadjusted base weight estimates of nonresponse bias for various characteristics from the Parent and Family Involvement in Education (PFI) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment PFI respondents			Full treatment PFI respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Parents' educational attainment									
High school diploma or below	269	30.2	2.47	326	30.8	2.27	-0.5	0.54	-1.9
Beyond high school diploma	690	69.8	2.47	797	69.2	2.27	0.5	0.54	0.9
Parents' language									
Both/only parent(s) speak(s) English	861	90.5	2.19	1012	91.0	2.17	-0.5	0.16	-0.5
One of two parents speaks English	20	2.1	0.47	22	2.0	0.51	0.1	0.10	5.0
No parent speaks English	59	7.4	2.01	66	7.0	1.94	0.4	0.15	5.7
Mothers' employment status									
35 hours or more per week	445	45.1	2.61	521	45.2	2.38	0.0	0.52	-0.2
Less than 35 hours per week	219	22.2	2.15	260	22.5	1.84	-0.3	0.58	-1.3
Looking for work	41	4.7	0.75	45	4.5	0.61	0.2	0.24	4.4
Not in labor force	207	23.9	1.67	241	23.8	1.29	0.2	0.67	0.4
No mother in household	47	4.0	0.55	56	4.0	0.56	-0.1	0.18	#
Poverty status									
Poor	164	21.9	2.51	221	23.8	2.41	-1.9	0.47	-8.0
Nonpoor	795	78.1	2.51	902	76.2	2.41	1.9	0.47	2.5
Household income									
Less than $15,000	115	14.8	1.68	153	15.6	1.45	-0.8	0.42	-5.1
$15,001 to $30,000	141	15.2	1.66	179	16.5	1.72	-1.3	0.58	-7.9
$30,001 to $50,000	152	15.8	1.75	171	15.2	1.63	0.6	0.24	3.9
More than $50,000	551	54.2	2.64	620	52.7	2.54	1.6	0.49	2.8

See notes at end of table.

Table G-2. Unadjusted base weight estimates of nonresponse bias for various characteristics from the Parent and Family Involvement in Education (PFI) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment PFI respondents			Full treatment PFI respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Family structure									
Mother and father	706	74.9	1.66	823	74.8	1.64	#	0.39	0.1
Mother	172	18.3	1.32	204	18.3	1.17	0.1	0.41	#
Father	45	3.7	0.48	54	3.8	0.49	-0.1	0.18	-2.6
Nonparent guardian(s)	36	3.1	0.49	42	3.1	0.52	#	0.16	#
School type									
Public	840	89.5	1.27	989	89.7	1.28	-0.2	0.24	-0.2
Private	101	10.5	1.27	114	10.3	1.28	0.2	0.24	1.9
School size									
Under 300	148	16.3	1.44	167	15.5	1.32	0.8	0.29	5.2
300-599	275	30.2	2.75	321	30.0	2.68	0.2	0.26	0.7
600-999	241	25.5	2.15	286	25.9	2.06	-0.5	0.51	-1.5
1,000 or more	272	28.0	2.30	323	28.5	2.03	-0.5	0.54	-1.8

Rounds to zero.

[1] Bias is estimated as the difference between the reduced treatment PFI respondents estimate and the full treatment PFI respondents estimate.

[2] Relative bias is estimated as the bias estimate divided by the full treatment PFI respondents estimate, and is expressed as a percentage.

[3] Any 5 or more of the following: Attended a general school meeting; attended a meeting of the parent-teacher organization or association; went to a regularly scheduled parent-teacher conference with the student's teacher; attended a school or class event because of the student; served as a volunteer in the student's classroom or elsewhere in the school; participated in fundraising for the school; served on a school committee; and met with a guidance counselor in person.

[4] Any 4 or more of the following: School student attends this year; teachers student has this year; academic standards of the school; order and discipline at the school; and way that school staff interact with parents.

[5] Any 5 or more of the following: Told student a story; did arts and crafts with student; played sports, active games or exercised together; worked on projects such as building, making, or fixing something with student not as a chore; talked with student about family history or ethnic heritage; and played board games or did puzzles with student.

[6] Any 3 or more of the following: Visited a library; visited a bookstore; went to a play, concert, or other live show; visited an art gallery, museum, or historical site; visited a zoo or aquarium; attended an event sponsored by a community, religious, or ethnic group; and attended an athletic or sporting event (outside of school) in which the child was not a player.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education (PFI) Survey of the National Household Education Surveys Program, 2007.

Table G-3. Unadjusted base weight estimates of nonresponse bias for various characteristics from the Adult Education for Work-Related Reasons (AEWR) Survey: NHES:2007 Bias Study

Characteristic	Reduced treatment AEWR respondents			Full treatment AEWR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Participates in adult education for work-related reasons	433	40.1	1.63	495	39.4	1.42	0.7	0.57	1.8
Participates in employer-supported AEWR	307	69.5	3.43	347	69.4	3.16	0.1	0.49	0.1
Participates in distance education	251	58.9	2.75	285	58.4	2.28	0.4	0.80	0.9
Participates in program to earn a college or university degree	108	9.6	0.92	124	9.5	0.83	0.1	0.27	1.1
Participates in program to earn a vocational or technical diploma	48	4.2	0.63	56	4.3	0.61	-0.1	0.23	-2.3
Participates in formal apprenticeship program	5!	0.4!	0.20!	5!	0.3!	0.18!	#	0.02	#
Participates in work-related training or courses	368	34.1	1.62	416	33.3	1.55	0.8	0.42	2.4
Participates in 4 or more informal work-related learning activities[3]	290	29.1	2.22	324	28.3	1.88	0.8	0.65	2.8
Has any condition that limits ability to work	139	15.1	2.26	153	14.5	2.15	0.6	0.30	4.1

See notes at end of table.

Table G-3. Unadjusted base weight estimates of nonresponse bias for various characteristics from the Adult Education for Work-Related Reasons (AEWR) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment AEWR respondents			Full treatment AEWR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Age									
16 to 24 years	89	11.6	1.45	104	11.8	1.51	-0.2	0.38	-1.7
25 to 34 years	143	17.0	1.60	168	17.3	1.69	-0.3	0.37	-1.7
35 to 44 years	111	15.0	1.46	131	15.2	1.29	-0.2	0.41	-1.3
45 to 54 years	195	21.2	1.04	217	20.8	0.87	0.4	0.35	1.9
55 years and older	393	35.1	1.86	445	34.9	1.62	0.3	0.56	0.6
Census region									
Northeast	233	27.0	5.61	259	26.9	5.46	0.1	0.60	0.4
Midwest	207	20.4	3.83	235	20.2	3.67	0.2	0.43	1.0
South	260	28.2	2.25	314	29.3	2.06	-1.1	0.65	-3.8
West	231	24.4	1.87	257	23.6	1.78	0.8	0.43	3.4
Home tenure									
Own	693	72.5	2.52	794	73.2	2.51	-0.7	0.53	-1.0
Rent/other	238	27.5	2.52	271	26.8	2.51	0.7	0.53	2.6
Household size									
1 person	245	14.8	1.30	278	14.6	1.08	0.2	0.37	1.4
More than 1 person	686	85.2	1.30	787	85.4	1.08	-0.2	0.37	-0.2
Marital status									
Never married	217	23.2	1.67	249	23.2	1.71	#	0.52	#
Currently married	468	56.3	1.77	531	55.8	1.66	0.5	0.65	0.9
Other	246	20.5	1.69	285	21.0	1.37	-0.5	0.52	-2.4

See notes at end of table.

Table G-3. Unadjusted base weight estimates of nonresponse bias for various characteristics from the Adult Education for Work-Related Reasons (AEWR) Survey: NHES:2007 Bias Study—Continued

Characteristic	Reduced treatment AEWR respondents			Full treatment AEWR respondents			Bias[1]		Relative bias[2]
	Sample size	Estimate (percent)	Standard error	Sample size	Estimate (percent)	Standard error	Estimate (percent)	Standard error	Estimate (percent)
Household income									
Less than $15,000	154	15.3	1.30	194	16.7	1.18	-1.4	0.44	-8.4
$15,001 to $30,000	173	19.1	2.27	212	20.2	1.80	-1.1	0.68	-5.4
$30,001 to $50,000	171	19.8	1.68	188	19.0	1.67	0.8	0.31	4.2
More than $50,000	433	45.8	1.98	471	44.1	1.49	1.6	0.81	3.9
Language spoken most at home									
English	876	92.1	1.84	999	91.9	1.75	0.3	0.21	0.2
Spanish	33	5.3	1.55	39	5.2	1.50	0.1	0.25	1.9
Other language	15	1.9	0.82	18	1.9	0.76	-0.1	0.17	#
English and Spanish equally	7	0.7	0.29	8	0.7	0.23	-0.1	0.17	#
English and other language equally	#	#	#	‡	‡	‡	‡	‡	‡
Employment status									
Employed	551	59.4	2.42	627	59.1	2.16	0.3	0.54	0.5
Unemployed but looking for work	36	4.8	1.38	44	5.0	1.17	-0.2	0.39	-4.0
Not in the labor force	344	35.9	1.98	394	35.9	1.81	#	0.67	#

Rounds to zero.

! Interpret with caution.

‡ Reporting standards not met.

[1] Bias is estimated as the difference between the reduced treatment AEWR respondents estimate and the full treatment AEWR respondents estimate.

[2] Relative bias is estimated as the bias estimate divided by the full treatment AEWR respondents estimate, and is expressed as a percentage.

[3]Any 4 or more of the following: Received on-the-job demonstrations of equipment, techniques, or procedures by a supervisor or coworker; received other supervised training or mentoring on the job; self-paced study using books, procedures manuals, audio tapes, or videos; self-paced study using computer-based software tutorials; attended "brown-bag" or informal presentations; attended conferences, trade shows, or conventions related to the adult's work or profession; and read professional journals, trade publications, or work-related magazines.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education for Work-Related Reasons Survey of the National Household Education Surveys Program, 2007.

This page is intentionally blank.

www.ed.gov

ies.ed.gov