

Chapter 4

Evaluation of Operations and Data

Evaluation of study methodology and procedures, as well as of study outcomes and products, were planned and conducted throughout the course of NPSAS:2000. The results of these quantitative and qualitative analyses provide information pertaining to the efficacy of study data and are also useful in planning for subsequent waves of NPSAS.

4.1 Enrollment List Acquisition and Processing

To facilitate control over student sample yield, student sampling within an institution was deferred until student enrollment lists were obtained for all applicable terms. Additionally, for institutions conferring bachelor's degrees, student sampling could not be done until lists identifying baccalaureate recipients had been received. Given these constraints and those imposed by the sequential nature of the student data collection (i.e., CPS matching followed by institutional records collection and then telephone interviewing), and considering the study timeframe for completion of these activities, it was important to obtain enrollment lists from institutions as early as possible in the 2000 calendar year. However, under the adopted study design, delays were necessitated at institutions using certain calendar systems. Of course, other delays were caused by insufficient institutional resources, adoption of new record-keeping systems, confidentiality policies, and the like. Even though reimbursement was offered for computer and staff time needed to compile the lists, obtaining the lists at a number of institutions involved a considerable number of prompting and follow-up telephone calls.

The process of contacting institutions and obtaining student enrollment lists spanned a 12-month period, from January through December 2000, during which time usable lists were obtained from 999 of the eligible sample institutions. Table 4-1 presents the number of enrollment lists returned by month and by institutional calendar system; cumulative receipt is depicted in figure 4-1.

As can be seen, about two-thirds of the enrollment lists were obtained by the end of June, and 95 percent of all institutions that provided lists did so by the end of September. Because institutions using semester/trimester systems represented about 75 percent of the total participating institutions, the "all institution" results closely parallel those with this type of calendar system.

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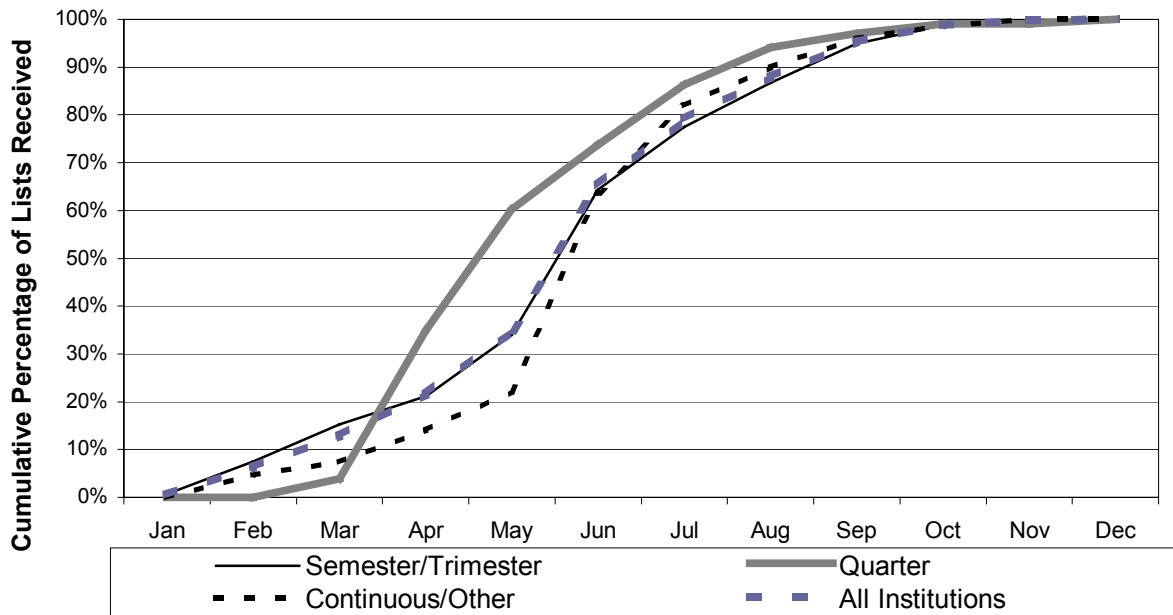
Table 4-1.—Enrollment list receipt, by month, and institutional calendar system

Month	All institutions		Semester/trimester		Quarter		Continuous/other	
	Number received	Percent	Number received	Percent	Number received	Percent	Number received	Percent
All months	999	100.0	747	74.8	103	10.3	149	14.9
Jan	5	0.5	5	0.5	0	0.0	0	0.0
Feb	58	5.8	51	5.1	0	0.0	7	0.7
Mar	66	6.6	58	5.8	4	0.4	4	0.4
Apr	86	8.6	44	4.4	32	3.2	10	1.0
May	134	13.4	96	9.6	26	2.6	12	1.2
Jun	303	30.3	227	22.7	14	1.4	62	6.2
Jul	138	13.8	98	9.8	13	1.3	27	2.7
Aug	89	8.9	69	6.9	8	0.8	12	1.2
Sep	73	7.3	61	6.1	3	0.3	9	0.9
Oct	35	3.5	29	2.9	2	0.2	4	0.4
Nov	10	1.0	8	0.8	0	0.0	2	0.2
Dec	2	0.2	1	0.1	1	0.1	0	0.0

NOTE: All statistics are based on eligible institutions that provided enrollment lists. Percentages are based on the “all months” total for all institutions.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Figure 4-1.—Cumulative percentage of enrollment list receipt, by month (2000), and institutional calendar system



SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

As noted above, some delays were directly attributable to the institution’s calendar system. Institutions using a quarter system were considerably more likely than those on a semester/trimester or continuous enrollment system to provide lists early; 60 percent of the institutions on the quarter system provided complete student lists by the end of May compared to only 34 percent of the institutions on the semester/trimester system and 22 percent of the institutions on a continuous or other calendar system. This is in marked contrast to the list

acquisition experience in NPSAS:96, which resulted in 80 percent of the semester/trimester institutions providing lists by May of the study year. Differences in list acquisition rates between NPSAS:96 and NPSAS:2000 can be explained by the need in NPSAS:2000 to collect lists of graduating seniors for sampling of the B&B cohort. Institutions including such students were unable to identify them until later in the academic year.

Institutional participation was also examined for potential effects of prior NPSAS participation. Summary results of these analyses are shown in table 4-2. Among eligible institutions, the NPSAS:2000 enrollment list provision rate among the 411 institutions that had previously participated in NPSAS was 94 percent. The list provision rate was 93 percent among the 612 institutions that had not previously participated in any NPSAS.

Institutional participation across NPSAS rounds also was examined in terms of the Carnegie classification categories, as shown in table 4-3. Table 4-4 shows the distribution of NPSAS:2000 participating institutions by the 2000 Carnegie classification. Table 4-5 shows the number of historically black colleges and universities participating in the current and prior NPSAS rounds.

Although an electronic list was preferred, institutions were told that they could provide lists in their preferred format. Types of lists provided by participating institutions are shown, by highest level of offering, in table 4-6. Overall, about 86 percent of institutions provided some type of electronic list, and the remaining 14 percent sent only paper-copy lists. Less-than-2-year institutions provided paper-copy lists more often than electronic lists. Two-year and 4-year institutions provided electronic lists about 85 percent or more of the time. This is quite likely related to 2- and 4-year institutions having larger average sizes (and associated increased capability of the computing facility and staff).

Returned lists also were evaluated in terms of appropriateness of format and documentation (relative to instructions provided), and accuracy of student counts. Table 4-7 indicates the major types of discrepancies encountered with the lists received. Over half of the institutions provided lists with one or more such problems, and among problems encountered, the principal one (involving about a third of the institutions) was “suspect count.” This check involved disagreement, by 25 percent or more, between the count obtained from lists (after correction for duplication) and the “unduplicated” count from the 1998–99 IPEDS IC file.¹ The check was not suspended or relaxed (unlike prior rounds of NPSAS) because many of the institutions that were called about the discrepancy indicated that the sampling list counts were, in fact, incorrect.

The next most frequent single problem experienced with provided lists (involving about 5 percent of the institutions overall) was failure to identify student strata; i.e., the institution did not provide student level or major field of study for baccalaureate recipients. This problem only existed for 4-year institutions because less-than-4-year institutions had only an undergraduate stratum. The percentage of institutions with multiple problems was 8.8 percent, and many of these included inability to identify strata.

¹Separate checks were performed, where applicable, for baccalaureates, undergraduates, graduate students, and first-professional students.

Table 4-2.—Institutional NPSAS:2000 enrollment list participation, by prior NPSAS participation

Type of institution ¹	Eligible institutions	No prior NPSAS participation		Participated at least once	
		Provided lists		Provided lists	
		Number	Percent ²	Number	Percent ³
All institutions	1,072	661	92.6	411	94.2
Institution level					
Less-than-2-year	117	89	88.1	16	87.5
2-year	244	167	94.4	67	97.0
4-year non-doctorate-granting	315	215	91.6	100	95.0
4-year doctorate-granting	396	168	94.6	228	93.4
Institutional control					
Public	576	322	93.5	254	96.1
Private not-for-profit	371	234	91.0	137	92.0
Private for-profit	125	105	93.3	20	85.0
Institutional sector					
Public less than-2-year	32	20	80.0	12	100.0
Public 2-year	196	141	93.6	55	96.4
Public 4-year non-doctorate-granting	127	67	95.5	60	98.3
Public 4-year doctorate-granting	221	94	94.7	127	94.5
Private not-for-profit 2-year or less	32	27	92.6	5	100.0
Private not-for-profit 4-year non-doctorate-granting	171	136	89.0	35	91.4
Private not-for-profit 4-year doctorate-granting	168	71	94.4	97	91.8
Private for-profit less than-2-year	75	71	91.5	4	50.0
Private for-profit 2-year or more	50	34	97.1	16	93.8

¹ Institutional classifications were verified by the institutions to correct classification errors on the sampling frame.

² Percentages are based on the count of eligible institutions with no prior NPSAS participation within the row under consideration.

³ Percentages are based on the count of eligible institutions with prior NPSAS participation within the row under consideration.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Table 4-3.—Distribution of participating NPSAS institutions, by participation in NPSAS, by Carnegie classification category and year of study

Carnegie institutional classification (1994)	NPSAS:87		NPSAS:90		NPSAS:93		NPSAS:96		NPSAS:2000	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All institutions	880	100.0	990	100.0	1,061	100.0	836	100.0	999	100.0
Research I	72	8.2	64	6.5	67	6.3	78	9.3	83	8.3
Public	49	5.6	44	4.4	51	4.8	53	6.3	56	3.0
Non-public	23	2.6	20	2.0	16	1.5	25	3.0	27	1.5
Research II	25	2.9	22	2.2	25	2.4	23	2.8	33	3.3
Public	15	1.7	14	1.4	19	1.8	15	1.8	25	1.4
Non-public	10	1.1	8	0.8	6	0.6	8	1.0	8	0.4
Doctoral I	30	3.4	27	2.7	31	2.9	36	4.3	42	4.2
Public	14	1.6	10	1.0	15	1.4	16	1.9	24	1.3
Non-public	16	1.8	17	1.7	16	1.5	20	2.4	18	1.0
Doctoral II	31	3.5	37	3.7	38	3.6	31	3.7	40	4.0
Public	14	1.6	19	1.9	22	2.1	19	2.3	28	1.5
Non-public	17	1.9	18	1.8	16	1.5	12	1.4	12	0.7
Master's I	127	14.5	154	15.6	227	21.4	167	20.0	232	23.2
Public	77	8.8	89	9.0	136	12.8	107	12.8	138	7.5
Non-public	50	5.7	65	6.6	91	8.6	60	7.2	94	5.1
Master's II	14	1.5	19	1.9	33	3.1	22	2.6	25	2.5
Public	5	0.6	6	0.6	13	1.2	6	0.7	8	0.4
Non-public	9	1.0	13	1.3	20	1.9	16	1.9	17	0.9
Baccalaureate I	25	2.9	27	2.7	46	4.3	18	2.2	25	2.5
Baccalaureate II	50	5.7	63	6.4	104	9.8	56	6.7	83	8.3
Associate of arts colleges	236	26.8	247	24.9	225	21.2	202	24.2	211	21.1
Theological	18	2.0	8	0.8	18	1.7	9	1.1	10	1.0
Medical	5	0.5	16	1.6	22	2.1	4	0.5	17	1.7
Other health	7	0.8	12	1.2	11	1.0	5	0.6	6	0.6
Engineering and technology	9	1.0	6	0.6	6	0.6	3	0.4	7	0.7
Business and management	13	1.5	12	1.2	10	0.9	13	1.6	11	1.1
Other*	12	1.4	18	1.8	25	2.4	11	1.3	15	1.5
Not classified	206	23.4	258	26.1	173	16.3	158	18.9	159	15.9

*Includes art/music/design, law, teaching, other specialized, and tribal colleges and universities.

NOTE: To protect confidentiality, breakdowns are not provided by institution control, except as shown above. Since completion of the NPSAS:96, a revised Carnegie classification system has been adopted (see table 4-4). However, for purposes of historical comparison, the distribution of participating NPSAS:2000 institutions is presented here based on the former Carnegie classification categories.

NOTE: Details may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1989–90, 1992–93, 1995–96, 1999–2000.

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Table 4-4.—Distribution of participating NPSAS:2000 institutions, by 2000 Carnegie classification

Carnegie institutional classification (2000)	Number	Percent
All institutions	999	100.0
Doctoral/research extensive	138	13.8
Doctoral/research intensive	78	7.8
Master's I	240	24.0
Master's II	27	2.7
Baccalaureate I	32	3.2
Baccalaureate II	50	5.0
Baccalaureate/associate's colleges	13	1.3
Associate's colleges	216	21.6
Theological	11	1.1
Medical	15	1.5
Other health	7	0.7
Engineering and technology	6	0.6
Business and management	8	0.8
Other*	17	1.7
Not classified	141	14.1

*Includes law, teaching, other specialized, and tribal colleges and universities.

NOTE: Details may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Table 4-5.—NPSAS participation of historically black colleges and universities (HBCU)

Participated in:	Number of HBCU's participating	HBCU's as a percentage of total number of participating institutions
NPSAS:87	17	1.9
NPSAS:90	15	1.5
NPSAS:93	28	2.6
NPSAS:96	16	1.9
NPSAS:2000	23	2.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Table 4-6.—Types of student lists provided by institutions, by highest level of offering

Highest level of offering	Type of lists received	Number	Percent*
All institutions	All lists	999	100.0
	Electronic	850	85.1
	Hard-copy	143	14.3
	Both electronic and hard-copy	6	0.6
Less-than-2-year	All lists	104	100.0
	Electronic	41	39.4
	Hard-copy	63	60.6
	Both electronic and hard-copy	0	0.0
2-year	All lists	232	100.0
	Electronic	198	85.3
	Hard-copy	31	13.4
	Both electronic and hard-copy	3	1.3
4-year non-doctorate-granting	All lists	292	100.0
	Electronic	263	90.1
	Hard-copy	29	9.9
	Both electronic and hard-copy	0	0.0
4-year doctorate-granting	All lists	373	100.0
	Electronic	349	93.6
	Hard-copy	21	5.6
	Both electronic and hard-copy	3	0.8

*Percentages are based on the “all lists” total within the type of institution under consideration.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

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Table 4-7.—Types of discrepancies encountered with student lists, by highest level of offering

Highest level of offering	Type of discrepancy encountered ¹	Number	Percent ²
All institutions (<i>n</i> =999)	None	441	44.1
	Count out of bounds	333	33.3
	Unreadable file/list	6	0.6
	No baccalaureate list	21	2.1
	Missing term	20	2.0
	Could not identify strata	50	5.0
	Multiple problems	88	8.8
	Other	40	4.0
Less-than-2-year (<i>n</i> =103)	None	50	48.5
	Count out of bounds	38	36.9
	Unreadable file/list	2	1.9
	Missing term	3	2.9
	Multiple problems	2	1.9
	Other	8	7.8
2-year (<i>n</i> =232)	None	144	62.1
	Count out of bounds	74	31.9
	Unreadable file/list	3	1.3
	Missing term	2	0.9
	Multiple problems	2	0.9
	Other	7	3.0
4-year non-doctorate-granting (<i>n</i> =292)	None	111	38.0
	Count out of bounds	94	32.2
	No baccalaureate list	9	3.1
	Missing term	9	3.1
	Could not identify strata	20	6.8
	Multiple problems	38	13.0
	Other	11	3.8
4-year doctorate-granting (<i>n</i> =372)	None	136	36.6
	Count out of bounds	127	34.1
	Unreadable file/list	1	0.3
	No baccalaureate list	12	3.2
	Missing term	6	1.6
	Could not identify strata	30	8.1
	Multiple problems	46	12.4
	Other	14	3.8

¹Categories are mutually exclusive, with an institution being included in only one category within highest level of offering.

²Percentages are based on the “all lists” total (*n*) within the type of institution under consideration.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

4.2 Institutional Record Abstracting

CADE procedures to abstract information from institutional student records were first initiated in NPSAS:93. As a result of feedback from NPSAS:93 and NPSAS:96 Institutional Coordinators, a number of procedures were implemented for NPSAS:2000 to enhance the effectiveness and user-friendliness of the approach, particularly for the institutional CADE users.

Other CADE procedural refinements were introduced to facilitate the timeliness of CADE completion, including (1) prescheduling institutions for field staff, (2) maintaining a “hotline” to resolve operational or interpretational problems, (3) scheduling biweekly calls to prompt Web-CADE institutions and to answer questions that may have arisen, and (4) scheduling weekly calls to field staff to assess their progress.

4.2.1 Preloading Record Data into CADE

To reduce the CADE data entry effort, a large number of elements (summarized in table 4-8) were preloaded into CADE records prior to collection at the institution. This included customizing the financial aid award section of CADE to include nonfederal aid that was common to a particular institution. Such customization proved highly successful during NPSAS:96 and during the NPSAS:2000 field test. Therefore, it was repeated for the NPSAS:2000 full-scale study.

Table 4-8.—Nature and source of elements preloaded into CADE

CADE data element set	Data source
Institution name/ID	IPEDS
Names of most common institution financial aid awards	Institutional Coordinator
Names of most common state financial aid awards	Sallie Mae state aid
Institution clock/credit hour indicator	IPEDS, Institutional Coordinator
Institution term names and dates	Institutional Coordinator
Student name, SSN, student ID in institution records	Enrollment list
Student type indicator (undergraduate/graduate/first-professional)	Enrollment list
Student date of birth, veteran status, and citizenship	CPS record
Student address, phone number, driver’s license number and state	CPS record
Student dependency and expected family contribution	CPS record
Flag indicating whether or not student matched to CPS	CPS record

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Data were preloaded from a variety of sources. These sources include IPEDS and the Sallie Mae state aid report, in addition to data collected from contact with the Institutional Coordinator and from enrollment lists. The most extensive set of preloaded data were obtained from the CPS for federal financial aid applicants. The data from the CPS were used in two different ways. Some items were prefilled with the data from the CPS and users could simply leave it there if it was correct. These data elements included the student’s address, phone number, driver’s license number, driver’s license state, dependency status, and expected family contribution to postsecondary education costs. Other items were preloaded in order to validate the data entered by users. If users entered something different from what was preloaded from

CPS, they would get a warning indicating the difference and could choose to accept the data from CPS or to keep the data originally entered. These variables included citizenship status, veteran status, and student date of birth.

4.2.2 CADE Data Completeness

For a student to be considered a CADE respondent in NPSAS:2000, the student's record abstracted from the institution was required to indicate whether the student received any financial aid, some information regarding the student's enrollment status during the NPSAS year, and valid responses to a portion of the demographic items in the CADE student characteristics section. This definition was roughly equivalent to, though slightly more stringent than, that used in either NPSAS:93 or NPSAS:96.

Under this definition, as shown in the previous chapter (see table 3-4), 92 percent of the eligible sample students were classified as CADE respondents. In large measure, this was due to the user-friendly design of the Web-CADE software and the successful incorporation of data completeness checks built into the software application.

With regard to CADE item-level nonresponse, it is not surprising that certain items had a lower level of completeness than reflected in the overall CADE response rate. Institution record-keeping systems vary dramatically in the type of data elements maintained for each student, and it was anticipated that not all data elements would be available at every institution. However, as can be seen in table 4-9, most of the major CADE data elements showed a relatively high percentage in terms of item-level completeness.

Some differences in CADE data completeness between Web-CADE and field-CADE cases are apparent, as evidenced in table 4-9. The most notable difference is that field data collectors generally provided more complete phone number data than did self-CADE institutions. This phenomenon was also observed in NPSAS:96, and is undoubtedly a result of the emphasis placed on locating data during the field data collector training sessions. The overall completeness of the marital status item was, somewhat surprisingly, about eight percentage points lower in the full-scale study than was observed in the field test.

4.2.3 CADE Abstraction Method: Original Versus Final Choice

As was explained in chapter 3, the NPSAS Institutional Coordinator was given an option as to how information about sampled students would be abstracted from institution records. The first option was for the institution staff to use the Web-CADE application, while the second option was to have trained contractor field data collectors abstract the data. Additionally, institutions were given the option of providing data files with either complete CADE data or (as a last resort) abbreviated data (17 variables) for all sampled students. The first option was the recommended option, since it was the least expensive and the field test experience indicated that the Web-based approach was indeed feasible for most institutions.

Table 4-9.—CADE item completion rates, by method of abstraction

Data element	Method of abstraction							
	Total		Web		Field		Data file	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Total CADE respondents	59,284	100.0	41,134	100.0	15,210	100.0	2,940	100.0
Student characteristics								
Gender	58,627	98.9	40,535	98.5	15,152	99.6	2,940	100.0
Marital status	39,652	66.9	27,277	66.3	10,231	67.3	2,144	72.9
Citizenship	56,073	94.6	39,125	95.1	14,014	92.1	2,934	99.8
Veteran status	45,771	77.2	31,291	76.1	11,641	76.5	2,839	96.6
High school degree	42,788	72.2	29,824	72.5	10,827	71.2	2,137	72.7
Race	50,563	85.3	35,840	87.1	12,047	79.2	2,676	91.0
Hispanic status	49,645	83.7	34,354	83.5	12,383	81.4	2,908	98.9
At least one phone number	57,060	96.2	39,435	95.9	14,837	97.5	2,788	94.8
At least two phone numbers	14,656	24.7	8,916	21.7	5,086	33.4	654	22.2
Enrollment								
Type of degree program	56,923	96.0	39,680	96.5	14,725	96.8	2,518	85.6
Student class level	53,269	89.9	37,558	91.3	13,243	87.1	2,468	83.9
Tuition jurisdiction classification	36,754	98.2	24,573	99.3	9,666	99.1	2,515	86.2
Financial aid*								
Any aid received	59,284	100.0	41,134	100.0	15,210	100.0	2,940	100.0
Federal aid received	59,064	99.6	41,091	99.9	15,110	99.3	2,863	97.4
State aid received	59,012	99.5	41,079	99.9	15,076	99.1	2,857	97.2
Undergraduate aid received	58,996	99.5	41,088	99.9	15,078	99.1	2,830	96.3
Graduate aid received	58,942	99.4	41,077	99.9	15,090	99.2	2,775	94.4
Other aid received	58,989	99.5	41,079	99.9	15,089	99.2	2,821	96.0

*These items were yes/no questions. Aid amounts were collected in separate follow-up questions.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

As can be seen in table 4-10, the large majority of Institutional Coordinators (88 percent) initially chose the first option (Web-CADE). Subsequently, a portion of the coordinators changed their preference and several more were convinced to convert to field-CADE by RTI in order to ensure timely completion of this phase of study data collection. The relatively high proportion of sample institutions that completed Web-CADE (71 percent) indicates that neither confidentiality concerns nor inadequate access to the Internet turned out to be major hindrances for the study.

The option of providing the CADE data via a structured data file was offered to institutions more aggressively than in previous NPSAS studies, and this option was ultimately selected by about 7 percent of the institutions. The relatively complex structure of the CADE database resulted in many institutions initially selecting this abstraction method but subsequently opting for either Web-CADE or field-CADE. On the other hand, some institutions initially selecting data file CADE, as well as others selecting Web-CADE, subsequently decided to respond with a data file.

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Table 4-10.—Institutional original and final choices of record abstraction method

Type of institution ¹	Total participating institutions	Original abstraction method ²					
		Web number	Percent	Field number	Percent	Data file number	Percent
Total	999	877	87.8	62	6.2	60	6.0
Institutional level							
Less-than-2-year	103	94	91.3	4	3.9	5	4.9
2-year	232	203	87.5	17	7.3	12	5.2
4-year non-doctorate-granting	292	264	90.4	11	3.8	17	5.8
4-year doctorate granting	372	316	84.9	30	8.1	26	7.0
Institutional control							
Public	545	470	86.2	34	6.2	41	7.5
Private not-for-profit	339	302	89.1	23	6.8	14	4.1
Private for profit	115	105	91.3	5	4.3	5	4.3
Institutional sector							
Public Less than 2-year	28	24	85.7	2	7.1	2	7.1
Public 2-year	185	164	88.6	11	5.9	10	5.4
Public 4-year non-doctorate granting	123	108	87.8	5	4.1	10	8.1
Public 4-year doctorate granting	209	174	83.3	16	7.7	19	9.1
Private not-for-profit 2-year or less	30	27	90.0	3	10.0	0	0.0
Private not-for-profit 4-year non-doctorate granting	153	140	91.5	6	3.9	7	4.6
Private not-for-profit 4-year doctorate granting	156	135	86.5	14	9.0	7	4.5
Private for-profit Less than 2-year	67	62	92.5	2	3.0	3	4.5
Private for-profit 2-year or more	48	43	89.6	3	6.3	2	4.2

Type of institution ¹	Total participating institutions	Final abstraction method ³					
		Web number	Percent	Field number	Percent	Data file number	Percent
Total	999	707	70.8	221	22.1	71	7.1
Institutional level							
Less-than-2-year	103	64	62.1	29	28.2	10	9.7
2-year	232	184	79.3	37	15.9	11	4.7
4-year non-doctorate-granting	292	217	74.3	54	18.5	21	7.2
4-year doctorate granting	372	242	65.1	101	27.2	29	7.8
Institutional control							
Public	545	372	68.3	124	22.8	49	9.0
Private not-for-profit	339	256	75.5	67	19.8	16	4.7
Private for profit	115	79	68.7	30	26.1	6	5.2
Institutional sector							
Public less than 2-year	28	15	53.6	10	35.7	3	10.7
Public 2-year	185	151	81.6	24	13.0	10	5.4
Public 4-year non-doctorate granting	123	83	67.5	28	22.8	12	9.8
Public 4-year doctorate granting	209	123	58.9	62	29.7	24	11.5
Private not-for-profit 2-year or less	30	17	56.7	11	36.7	2	6.7
Private not-for-profit 4-year non-doctorate granting	153	120	78.4	24	15.7	9	5.9
Private not-for-profit 4-year doctorate granting	156	119	76.3	32	20.5	5	3.2
Private for-profit Less than 2-year	67	45	67.2	16	23.9	6	9.0
Private for-profit 2-year or more	48	34	70.8	14	29.2	0	0.0

¹Institution classifications for this table were verified by the participating institutions.

²This choice was made by the Institutional Coordinator prior to any attempts at record abstraction.

³The final method is the procedure through which record abstraction was completed at the institution; the original method may have been used to obtain some data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

4.2.4 Timeliness of Record Abstraction

CADE systems were prepared on an institution-by-institution basis as enrollment lists were received, samples selected, and matching to the Central Processing System was completed. Web-CADE institutions began receiving notification that their systems had been initialized on March 23, 2000, with 59 institutions being provided Web-CADE passwords on that date. The first set of field-CADE data collectors was trained April 6–10, 2000, and began record abstraction activities later in April. Initialization of CADE systems continued through December 2000.

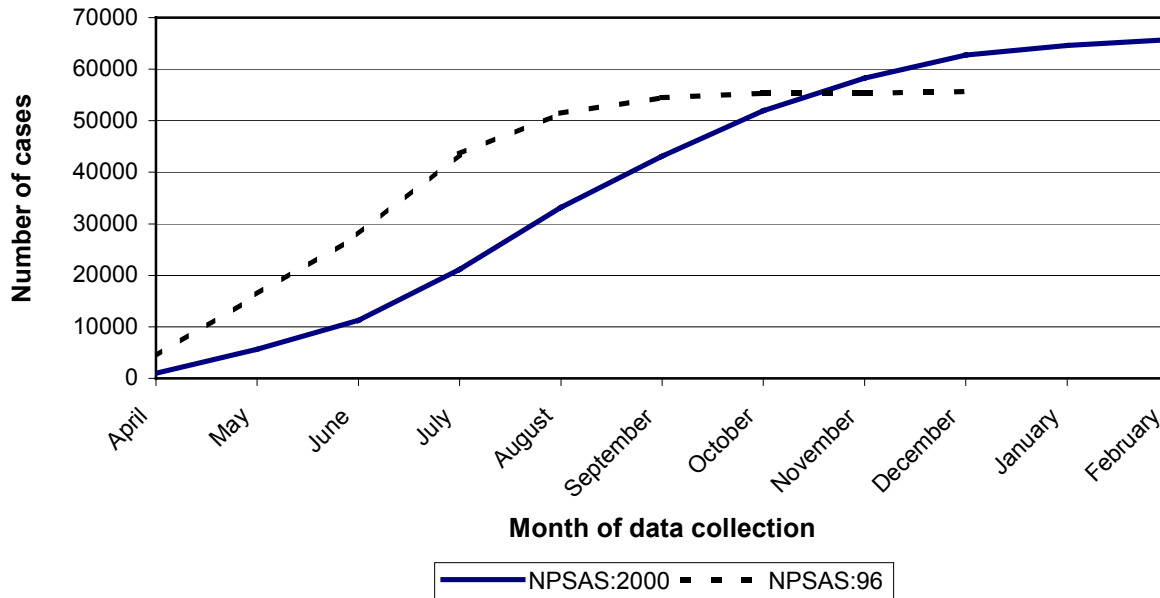
As can be seen below in figure 4-2, the flow of NPSAS:2000 CADE data from the institutions lagged behind the experience of NPSAS:96, even though the two data collections began on roughly the same calendar basis. As was indicated previously, enrollment lists were received over a more extended timeframe in NPSAS:2000, and the sequential nature of NPSAS data collection operations resulted in somewhat slower than anticipated flow of CADE data.

There are two primary explanations as to the observed difference between NPSAS:96 and NPSAS:2000 CADE flow. First, NPSAS:2000 served as the base year study for a cohort of baccalaureate recipients, whereas NPSAS:96 was the base year for a cohort of first-time beginning students. As described above in section 4.1, in NPSAS:2000 many of the 4-year institutions were unable or unwilling to provide a list of baccalaureate recipients until conclusion of all graduation activities, so that the enrollment lists from these institutions were not received until much later than in NPSAS:96. In both NPSAS:96 and NPSAS:2000, a large percentage of the study eligible students (71.4 percent in NPSAS:96 and 73.0 percent in NPSAS:2000) were sampled from 4-year institutions. NPSAS:96, however, did not require the identification of graduating seniors. Hence, the lists could be sent much earlier in the 1996 study.

Second, the NPSAS:2000 specifications as to which students to include on the enrollment lists differed from those used in NPSAS:96. Whereas in NPSAS:96 institutions were instructed to identify students enrolled in *terms beginning* between May 1 and April 30, in NPSAS:2000 they were asked to identify students enrolled *at any time* between July 1 and June 30. The impact of this procedural modification resulted in many institutions, especially those on a traditional semester or trimester academic calendar, needing to wait until the first summer school session had begun (typically in May or June) in order to accurately prepare the enrollment list. The same types of institutions, for NPSAS:96, were able to prepare enrollment lists shortly after the beginning of the spring term (typically in January or February).

The impact of the two above-mentioned factors was anticipated, and efforts were made to mitigate the resulting delays. First, unlike NPSAS:96, the NPSAS:2000 CADE systems were configured such that student-level data could be transmitted to RTI once the student-level case was complete. This differed from procedures used in NPSAS:96, in which the institutions were instructed to wait until all student data had been abstracted and entered before delivering these data to RTI. This improvement did result in CADE cases arriving on a more regular flow (as opposed to clusters of cases arriving in institution files) but did not dramatically shift the flow pattern being driven by the enrollment list receipt.

Figure 4-2.—Cumulative student flow of NPSAS:2000 CADE relative to NPSAS:96



SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

The second action, taken late in the data collection period, to mitigate the delayed flow of CADE data was to break the linkage between CADE and CATI steps. That is, cases for which a CPS match had been obtained (and therefore a student phone number was available) were loaded into CATI before the student CADE data had been obtained. While this effort, implemented late in the data collection schedule, proved relatively successful in expediting a small number of CATI interviews, it too was insufficient for overcoming the overall impact of a drawn-out enrollment list receipt process.

4.3 CATI Tracing and Interviewing

4.3.1 Time Lines of Student Interviewing

As mentioned previously, the study design of NPSAS:2000 called for both the student sampling from enrollment lists and student records abstraction to take place before student interviewing began. This design affected the flow of cases into CATI. The first CATI input files, including preloaded data from CADE, were created and loaded May 22, 2000. Loading of data into the CATI system continued on a flow basis through February 11, 2001. CATI data collection continued through February 28, 2001. The lengthy duration of the CATI survey was principally due to delays in enrollment list acquisition (and, therefore, student sample identification), which in turn delayed CPS matching and CADE data collection, and thus, the flow of cases into CATI. Additionally, a fire destroying one of the two RTI call centers occurred in early January 2001, necessitating the temporary closure of that facility and, ultimately, the extension of data collection by almost 6 weeks.

As shown in table 4-11, the CATI case flow also affected the success rates achieved. Among the total sample, approximately 75 percent of the cases loaded into CATI between May and July 2000 were located and interviewed. This percentage declined over time to 59 percent in January 2001 and 44 percent in February 2001, the last month of data collection. Similar patterns occurred for each student type as well.

Table 4-11.—NPSAS: 2000 response rates, by student type and month in which the case was loaded into CATI

Month loaded into CATI*	Total ¹		B&B students ²		Other undergraduate students ²		Graduate/first-professional students ²	
	Total number	Percent complete ³	Total number	Percent complete ³	Total number	Percent complete ³	Total number	Percent complete ³
Total	62,965	70.7	14,028	74.2	36,812	68.3	12,125	73.9
May 2000	3,867	75.9	969	79.0	2,433	73.6	465	81.7
June 2000	6,326	75.5	1,357	78.8	3,971	73.8	998	77.9
July 2000	9,804	74.9	2,332	77.0	5,902	72.7	1,570	80.3
August 2000	11,004	72.4	2,580	74.3	6,606	70.5	1,818	76.5
September 2000	9,482	71.7	2,296	75.0	5,211	69.2	1,975	74.6
October 2000	8,413	70.0	1,756	74.9	4,729	65.6	1,928	76.7
November 2000	8,920	65.1	1,719	71.1	5,291	61.8	1,910	69.0
December 2000	3,221	60.0	624	61.2	1,791	56.1	806	68.0
January 2001	1,274	58.5	263	56.7	594	57.7	417	60.7
February 2001	654	44.2	132	50.0	284	51.4	238	32.4

¹Statistics exclude 5,800 NPSAS-ineligible sample members (as determined during record extraction or in CATI); 875 sample members who were either unavailable for the duration of the survey, out of the country, or institutionalized; and about 650 cases that were sampled but never worked in CATI.

²Institution and student classifications were verified by participating institutions to correct classification errors on the sampling frame.

³Percentages are based on the “total number” of completed interviews in the column under consideration.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Figure 4-3 illustrates this relationship graphically. As can be seen, the interview completion rate decreased (i.e., the slope of the cumulative line flattens) during the later portions of the study, as efforts were limited to locating and interviewing the most difficult cases.

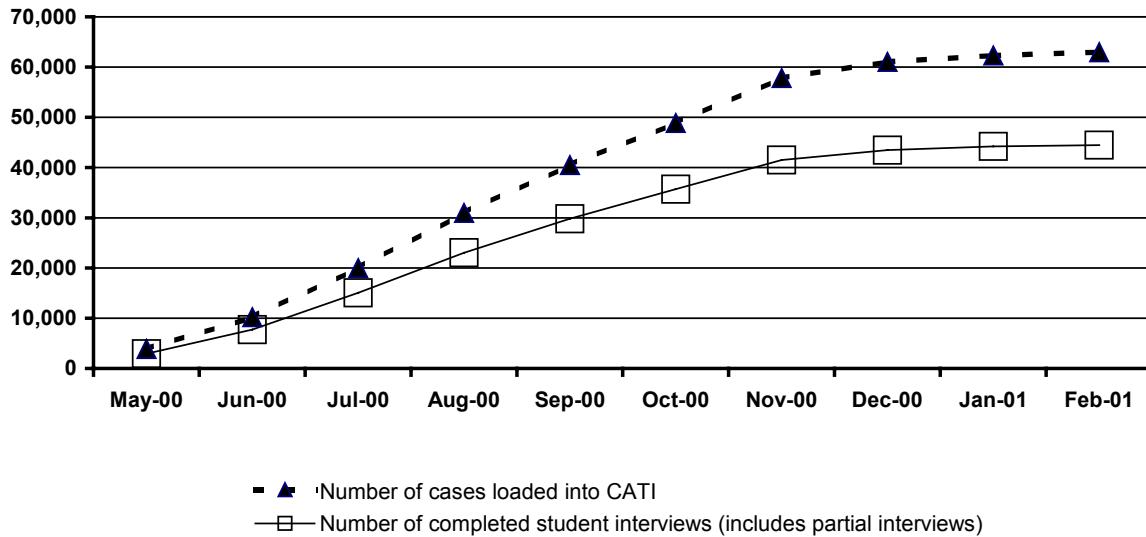
4.3.2 CATI Tracing and Locating Operations

The NPSAS:2000 student interview data collection included several tracing procedures as well as the use of a “locating” module in the CATI system. Cases for which preloaded CATI locating information failed to result in contact with the sample member required intensive tracing efforts. These intensive tracing activities were as follows.

- Cases with valid addresses (but no telephone number) were sent to Fast Data for telephone number updates, with new information returned to CATI for further follow-up.
- Cases from FastData without additional information were assigned to RTI’s Tracing Operations Unit (TOPS) for intensive tracing.
- Cases without valid mailing addresses or telephone numbers were assigned to TOPS for intensive tracing.

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Figure 4-3.—Cumulative cases loaded and completed interviews, by month of CATI data collection



SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

- Cases still unlocatable after intensive centralized tracing were assigned to field interviewers (if the last known address was in a geographic “cluster” or location staffed by a field interviewer) or to a field locator (if the last known address was not in a geographic “cluster”).

As shown in table 4-12, nearly one-third of the potentially eligible sample members required some form of intensive tracing (about 20,600 of 63,000 cases). Of the instances in which intensive tracing methods were used, 51 percent of the cases were located, and about 84 percent of the cases located completed the interview.

Table 4-12.—NPSAS:2000 contact and interview rates, by intensive tracing efforts

Tracing status	Total respondents ¹	Located		Interviewed, when located	
		Number	Percent	Number	Percent
Total	62,965	51,010	81.0	44,491	87.2
No intensive tracing required	42,407	40,468	95.4	35,589	87.9
Intensive tracing required	20,558	10,542	51.3	8,902	84.4

¹Statistics exclude 5,800 NPSAS-ineligible sample members (as determined during record extraction or in CATI); 870 sample members who were either unavailable for the duration of the survey, out of the country, or institutionalized; and about 640 cases that were sampled but never worked in CATI.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

A breakout of the cases requiring intensive tracing, by institution type and student type, is shown in table 4-13.

Table 4-13.—NPSAS:2000 students requiring intensive tracing procedures, by institution and student type

Institution /student type ¹	Total ²	Cases requiring intensive tracing efforts	
		Number	Percent
Total	62,960	20,558	32.6
Institutional level			
Less-than-2-year	5,560	2,164	38.9
2-year	11,350	3,945	34.7
4-year non-doctorate-granting	17,090	5,204	30.5
4-year doctorate-granting	28,960	9,253	32.0
Institutional control			
Public	39,330	12,632	32.1
Private not-for-profit	17,340	5,517	31.8
Private for-profit	6,300	2,409	38.2
Level/control combined			
Public less-than-2-year	1,150	405	35.2
Public 2-year	9,050	3,097	34.2
Public 4-year non-doctorate-granting	9,040	2,767	30.6
Public 4-year doctorate-granting	20,090	6,363	31.7
Private not-for-profit 2-year or less	1,530	591	38.6
Private not-for-profit 4-year non-doctorate-granting	7,290	2,179	29.9
Private not-for-profit 4-year doctorate-granting	8,520	2,747	32.2
Private for-profit less-than-2-year	3,940	1,547	39.3
Private for-profit 2-year or more	2,360	862	36.5
Student type			
Undergraduates	50,840	16,784	33.0
B&B	14,030	4,822	34.4
Other undergraduates	36,810	11,962	32.5
Graduate	10,090	3,391	33.6
First-professional	1,250	383	30.6

¹Institution and student classifications were verified by participating institutions to correct classification errors on the sampling frame.

²Statistics exclude 5,761 NPSAS-ineligible sample members (as determined during record extraction or in CATI); 868 sample members who were either unavailable for the duration of the survey, out of the country, or institutionalized; and 638 cases that were sampled but never worked in CATI.

NOTE: To protect confidentiality of data, some numbers were rounded.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

For tracing hard-to-locate sample members, generally no single source of information is—by itself—adequate to achieve the level of locating required. Rather, a successful locating effort requires multiple sources of information. Table 4-14 provides an overview of the sources used during intensive, centralized tracing of the hard-to-reach NPSAS:2000 sample members. Note that although the table provides information on the number and percentage of sample members who were ultimately located when a particular source was used, most of the cases were located using multiple sources.

Table 4-14.—NPSAS:2000 contact rates, by tracing source

Tracing source	Intensive tracing		
	Total	Contacted	
		Number	Percent
Centralized tracing			
Consumer database search – Experian	13,833	6,373	46.1
Directory assistance	12,738	5,765	45.3
Consumer database search – Equifax	11,064	5,327	48.1
Database – address search	10,356	4,734	45.7
Consumer database search – FirstPursuit	6,820	3,279	48.1
Database – name search	6,356	2,634	41.4
Directory Assistance–Plus	4,068	1,822	44.8
Database – reverse phone lookup	4,416	2,049	46.4
Internet search	3,806	1,578	41.5
Database – neighbor search	528	264	50.0
Other collateral source	2,500	1,148	45.9
Field tracing:			
Field locators	1,248	458	36.7
Field interviewers	2,252	1,024	45.5

NOTE: Most cases were traced using multiple sources so row totals and percentages are not mutually exclusive.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Centralized tracing efforts in the Tracing Operations Unit focused primarily on consumer database searches (via Experian, Equifax, and FirstPursuit) coupled with follow-up using directory assistance (DA) and/or address database searches. This technique resulted in the location of 45–48 percent of the sample members processed by TOPS. For cases not located strictly through these means, TOPS turned to alternative tracing sources, such as name searches, reverse telephone lookups, Internet searches, and neighbor searches. Using these techniques, TOPS was able to locate 41 to 50 percent of the remaining intensive cases.

In terms of field tracing, field locators—i.e., field staff who were not trained to conduct interviews but were assigned cases not located in a geographic area staffed by a field interviewer—traced and located nearly 37 percent of the cases they were assigned. Field interviewers (operating in geographic clusters) located approximately 46 percent of the cases assigned to them.

4.3.3 Refusal Conversion Efforts

Refusal conversion procedures were used to gain cooperation from individuals who refused to participate when contacted by telephone interviewers. Refusals came not only from sample members, but also from spouses, housemates, parents, and other “gatekeepers,” who provided proxy refusals for the sample members. When either a sample member or a gatekeeper refused to participate in the locating or interviewing effort, the case was referred to a specially trained refusal conversion specialist in the Telephone Survey Department. There were 16,179 initial refusals among the student sample (or 24 percent of the initially fielded sample of 66,339). Of these, 11,628 refusals were by sample members and 4,551 were by other contacted individuals (see table 4-15). In all, 54.5 percent of the initial refusals (by sample member or proxy) were successfully converted into completed interviews. The conversion rate among refusing sample members by source of refusal was nearly identical.

Table 4-15.—NPSAS:2000 conversion of initial refusals, given initial refusal

Sources of refusal	Number of initial refusals	Completed, given initial refusal	
		Number	Percent
Any contact	16,179	8,812	54.5
Sample member	11,628	6,279	54.0
Other individual	4,551	2,533	55.7

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

4.3.4 Number of Calls

As shown in table 4-16, telephone interviewers made 1,033,212 calls to students during the NPSAS:2000 full-scale study, with an average of about 16 calls per sample member.² Although not reflected in this table, the average was lower for completed cases only (mean call attempts = 12.2); 62 percent of the completed telephone interviews were completed with 10 or fewer calls, 29 percent required 11 to 29 calls, and 9 percent of the completed cases required 30 or more call attempts. Of the total number of calls made, approximately one in five (23 percent) reached an actual person, 44 percent reached a telephone answering machine, and 33 percent were other noncontacts (busy, ring/no-answer, fax line, pager, etc.).

4.3.5 Answering Machines, Messages, and Call-Ins

Answering machines and other call screening technologies (such as caller-ID, call-blocking, and privacy managers) are an increasing problem for all studies conducted by telephone. Regardless of whether the devices are used to screen unwanted calls or to facilitate “on the go” lifestyles, these devices pose an obstacle to contacting sample members and completing interviews. While it was not possible for interviewers to know if they had reached a phone number that had caller-ID, the number and percentage of times interviewers reached an answering machine was tracked. In all, an answering machine was reached on 458,000 of the 1,033,000 calls made (or 44 percent of the time). Answering machines are not, however, insurmountable barriers. Table 4-17 provides the locate and interview (given locate) rates for hard-to-reach cases. There was some variance in the locate rates based on whether or not an answering machine was reached. Interestingly, those cases for which no answering machine was reached proved to be the most difficult to contact, with just under 72 percent of the cases being contacted. This percentage went up (to 86 percent) for cases in which an answering machine was reached on fewer than half the call attempts. The locate rate decreased again (to 82 percent), however, for cases in which an answering machine was reached on 50 percent or more of the cases.

²These figures were captured by the study's computerized receipt control system and are based on calls made by telephone interviewers. They exclude calls made by TOPS, field interviewers, and field locators in the course of attempting to locate sample members.

Table 4-16.—Number and result of calls made to sample members by type of institution and type of student

Category	CATI sample cases	Total calls to sample cases	Calls per case	Reached someone		Did not reach anyone			
				Number	Percent	Answering machine		Other non-contact	
						Number	Percent	Number	Percent
Total	66,339	1,033,212	15.6	233,326	22.6	458,241	44.4	341,645	33.1
Institutional level	5,929	90,738	15.3	21,531	23.7	32,705	36.0	36,502	40.2
Less than 2-year	12,444	198,167	15.9	49,336	24.9	82,048	41.4	66,783	33.7
4-year, non-doctorate-granting	17,790	269,370	15.1	64,097	23.8	118,355	43.9	86,918	32.3
4-year, doctorate-granting	30,176	474,937	15.7	98,362	20.7	225,133	47.4	151,442	31.9
Institutional control	41,635	654,946	15.7	149,822	22.9	291,186	44.5	213,938	32.7
Public	18,113	273,119	15.1	59,838	21.9	126,265	46.2	87,016	31.9
Private not-for-profit	6,591	105,147	16.0	23,666	22.5	40,790	38.8	40,691	38.7
Private for-profit	1,263	18,872	14.9	4,734	25.1	7,115	37.7	7,023	37.2
Public 2-year	10,021	157,405	15.7	40,116	25.5	66,111	42.0	51,178	32.5
Public 4-year, non-doctorate-granting	9,451	146,418	15.5	35,441	24.2	63,505	43.4	47,472	32.4
Public 4-year, doctorate-granting	20,900	332,251	15.9	69,531	20.9	154,455	46.5	108,265	32.6
Private not-for-profit, 2 year or less	1,648	24,727	15.0	6,205	25.1	8,432	34.1	10,090	40.8
Private 4-year, non-doctorate-granting	7,557	110,222	14.6	25,866	23.5	49,144	44.6	35,212	32.0
Private not-for-profit, 4-year, doctorate-granting	8,908	138,170	15.5	27,767	20.1	68,689	49.7	41,714	30.2
Private for-profit, less-than-two-year	4,131	65,312	15.8	15,070	23.1	23,482	36.0	26,760	41.0
Private for-profit, 2-year or more	2,460	39,835	16.2	8,596	21.6	17,308	43.5	13,931	35.0
Student type ¹	53,721	857,516	16.0	198,676	23.2	366,945	42.8	291,895	34.0
Undergraduate	14,625	235,851	16.1	49,380	20.9	109,267	46.3	77,204	32.7
Baccalaureate recipient	39,096	621,665	15.9	149,296	24.0	257,678	41.5	214,691	34.5
Other undergraduate	11,330	153,181	13.5	30,477	19.9	79,380	51.8	43,324	28.3
Graduate	1,288	22,515	17.5	4,173	18.5	11,916	52.9	6,426	28.5

¹Institution and student classifications were verified by participating institutions to correct classification errors on the sampling frame.

NOTE: Statistics based on 66,339 cases loaded and worked in CATI, and restricted to calls made within the two CATI facilities (does not include calls made by the Tracing Operation Unit, field interviewers, or field locators). Percentages are based on total calls for row under consideration. Some rows may not add to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Table 4-17.—NPSAS:2000 locate and interview rates for hard-to-reach sample members, by percentage of calls in which an answering machine was reached

Extent of call attempts resulting in answering machine	Total hard-to-reach sample members ¹	Located		Interviewed, when located	
		Number	Percent	Number	Percent
All	28,195	23,271	82.5	18,202	78.2
None	3,444	2,475	71.9	2,017	81.5
Less than half	12,075	10,402	86.1	8,130	78.2
Half or more	12,676	10,394	82.0	8,055	77.5

¹Calculations include only cases with 10 or more call attempts (i.e., those considered to be hard to reach).

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Once the student was reached, however, there was less variation in terms of the percentage who completed the interview. Among the instances in which no answering machine was reached, 81.5 percent completed the interview. This compares with 78 percent for cases in which an answering machine was reached at least once.

Not surprisingly, the higher the percentage of calls in which an answering machine was reached, the greater the average number of call attempts required to complete the interview. Looking only at completed cases among this hard-to-reach set, an average of 18.4 calls was required to obtain a completed interview when no answering machine was encountered in the course of attempting to contact the sample member.³ In contrast, cases in which some—but less than 50 percent—of the call attempts reached an answering machine, took an average of 27.3 call attempts to complete the interview. Finally, among cases in which an answering machine was reached on more than half of the call attempts, it took on average 34.8 call attempts to complete an interview. Those who used answering machines were “reachable”; however, it took considerable persistence and resources (in the form of repeated call attempts) to reach these individuals.

Answering machines can also serve as a vehicle for making contact with a difficult-to-reach sample member. Messages left on answering machines are the functional equivalent of oral electronic lead letters, alerting a sample member to an impending call from an interviewer. For NPSAS:2000, a message was left the first and fourth time an answering machine was encountered at a particular telephone number. The message served two purposes: (1) to notify sample members that they had been selected for a research study and (implicitly) that they would be recontacted in the near future, and (2) to encourage sample members to call in to complete the interview.

As shown in table 4-18, a sizable portion of the sample initiated contact with RTI by calling the toll-free number. A total of 14,206 calls were received on the toll-free number established for the study. Among these, 82 percent (11,648 cases) completed the interview.⁴ Among those who did not complete the interview when they called in, calls were a relatively

³ Data on call attempts were captured by the study’s computerized control system.

⁴ This percentage assumes that all incoming calls were resolved, resulting in either a completed interview or a refusal to participate by the sample member. Data were captured by the study’s computerized receipt control system.

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even mix of refusals by the sample member, contact persons calling to provide new locating information for the sample member, or contacted individuals calling to say they did not know the sample member or did not know where to contact him or her.

Table 4-18.—NPSAS:2000 interview results, by call-in to toll-free number from message on answering machine

Message left on answering machine	Total cases ¹	Call-ins to toll-free number ²	
		Number	Percent
Total	62,965	14,206	22.6
No message	19,723	2,693	13.7
Message left	43,242	11,513	26.6

¹Statistics exclude 5,800 NPSAS-ineligible sample members (as determined during record extraction or in CATI); 875 sample members who were either unavailable for the duration of the survey, out of the country, or institutionalized; and about 650 cases that were sampled but never worked in CATI.

²Of the 14,206 call-ins, 82 percent (11,648 cases) completed the interview. This percentage assumes that all incoming calls were resolved, resulting in either a completed interview or a refusal to participate by the sample member. Data were captured by the study's computerized receipt control system.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

We also examined differences in call-in and completion patterns among cases in which the answering machine message was and was not left.⁵ The call-in rate was much higher among cases in which a message was left on an answering machine (27 percent) compared to cases in which no message was left (14 percent). Clearly, messages left on answering machines were successful in generating call-ins to the CATI facility for over one-quarter of the cases for which this approach was used.

4.3.6 Use of Incentives for Sample Members

A random assignment experiment conducted as part of the NPSAS:2000 field test demonstrated that offering financial incentives to sample members to encourage their participation in the study was a cost-effective means of reducing nonresponse. Consequently, incentives were used during the NPSAS:2000 full-scale study to reduce nonresponse primarily among two groups: (1) those who initially refused to participate in the study, and (2) those for whom there was a valid mailing address for the sample member, but no valid telephone number. Sample members selected to receive an incentive were sent a personalized letter delivered by express overnight service. Enclosed with the letter was a \$5 bill and instructions for completing the interview by calling a toll-free telephone number. After successfully completing the NPSAS:2000 interview, whether by call-in to the toll-free number or through a call initiated by a telephone interviewer, each respondent received an additional payment of \$15 by check.

During the course of the study, two additional incentive groups were defined. The first involved nonrefusing cases with 20 or more call attempts. These sample members may have been difficult to reach because they were hard to catch at home; or they may have been “passive refusals,” persons who did not refuse outright, but rather used call-screening devices or repeatedly delayed doing the interview. These “high call count” cases were not offered an

⁵ In addition to messages left on answering machines, sample members could have received the toll-free number in other ways, including the initial lead letter, incentive mailings, and messages left with parents or other contacts.

incentive by mail; rather, a message was left on their answering machine informing them that if they called in to conduct the interview, they would be paid \$20 for their participation. The cost savings from not mailing the offer (with \$5 enclosed) allowed the incentive to be offered to a larger number of sample members.

Finally, during the last 4 weeks of production (beginning February 1, 2001), a \$20 incentive was offered to all other nonrespondents who did not meet the previous conditions set for receiving an incentive. This “end of study” group was offered the incentive via answering machine and messages left with contacts. Like the previous group, to save resources they were not sent a mailing informing them of the incentive.

Table 4-19 provides an overview of the number of cases within each group offered an incentive and the percentage of cases completed given the offer of an incentive. A total of about 23,100 sample members were offered some form of incentive to participate. Interviews were completed with about half (11,500) of these cases. Success rates varied considerably by the type of nonrespondent. Among those who initially refused (either by telephone or by mail) to take part in the study, 59 percent (4,700 of 8,000 cases) completed the survey. Similar success was achieved for the high call count group, who were offered an incentive via an answering machine message. Interviews were completed with about 3,700 of the 6,400 cases in this group (57 percent). The incentive was less effective among those with a valid mailing address but no telephone number and those offered an incentive at the end of the study. Interviews were completed with 35 percent of the cases with no valid telephone number and with 36 percent of the cases offered an incentive during the last 4 weeks of the study.

Table 4-19.—NPSAS:2000 response rates among incentive cases

Incentive group	Total number	Complete, given incentive	
		Number	Percent
Total receiving incentive	23,061	11,493	49.8
Incentive after refusal	7,963	4,730	59.4
Valid address, no telephone number	2,705	944	34.9
Incentive offered via answering machine	6,443	3,680	57.1
End-of-study incentive offer	5,950	2,139	35.9

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

4.4 Length of Student Interview

During CATI/CAPI instrument development, project staff embedded time stamps at the start and end of the interview, as well as the beginning and end of each interview screen, which could include up to eight related items. The time stamps measured the elapsed time to complete each segment of the interview, and enabled project staff to monitor the time required to complete specific interview items, the online coding programs, individual sections of the interview, and the entire interview itself.

The time, in minutes, needed to conduct a student interview is shown, by interview section and student type, in table 4-20. Sections are listed in the table in the order in which they were presented. To use the most timing data available, results for each section of the interview were computed for all cases that completed that section. Total times reflect the average time

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required to complete the interview among all students who completed the sections that applied to them. Aside from the fact that section G (locating) applied only to B&B sample members, the bulk of the differences in numbers of cases contributing to the timing results over sections reflects “breakoff” interviews (which may have occurred with or without a scheduled call-back to complete the interview).

Average administration time to complete the student interview was 23.2 minutes for all students, 28.8 minutes for the B&B cohort members (i.e., verified B&Bs), 20.9 minutes for other undergraduates and 23.2 minutes for graduate/first-professional students. The additional time required for the B&B cohort is principally attributable to section E (which contained a number of questions that were only administered to such students) and the time required to obtain the much more comprehensive section G locating information for the longitudinal study sample.

Table 4-20.—Average minutes to complete NPSAS:2000 student interview, by interview section and student type

CATI section	All students		B&B students		Other undergraduate students		Graduate/first-professional students	
	Number	Minutes	Number	Minutes	Number	Minutes	Number	Minutes
Total	39,610	23.2	9,270	28.8	22,180	20.9	8,160	23.2
Section A – Enrollment/ eligibility	40,310	5.0	9,410	4.5	22,640	4.8	8,270	6.3
Section B – Student background	40,020	4.7	9,360	4.6	22,450	4.9	8,210	4.6
Section C – Financial aid	39,880	3.7	9,340	3.6	22,350	3.4	8,190	4.3
Section D – Employment/ income	39,620	6.7	9,290	6.9	22,180	6.6	8,160	6.8
Section E – Education experiences	39,610	2.6	9,280	5.3	22,180	1.7	8,160	1.8
Section F – Disability	39,600	0.7	9,280	0.7	22,160	0.8	8,150	0.7
Section G – Locating	9,270	4.5	9,270	4.5	†	†	†	†

†Not applicable.

NOTE: Section times are based on the number of respondents completing each section, excluding those who completed abbreviated interviews. A section was considered complete if the amount of time to complete the section was greater than zero and the section completion flag was set. Section outliers were removed from the timing analysis and numbers have been rounded.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Interview administration time, however, reflects only a small fraction of the time required to obtain a completed interview. Interviewers spent additional time in locating sample members, scheduling call-backs, attempting refusal conversion, and carrying out other related activities. This time was spent not only on cases that were ultimately interviewed but also on cases for which no interviews were obtained. The average locator/interviewer time requirement for each completed interview was about 2.0 hours.

4.5 Identifying Students Eligible for Baccalaureate and Beyond

As noted earlier, NPSAS:2000 serves as the base year of the Baccalaureate and Beyond longitudinal study. So that baccalaureate students could be identified, institutions were asked to send lists of students who received or were candidates to receive a baccalaureate degree at any time between July 1, 1999, and June 30, 2000. Since the actual list of bachelor’s degree recipients was not final at the time these lists were prepared, some sample students identified by the institution as baccalaureate candidates were determined during the CATI interview not to be baccalaureate recipients (false positives). Likewise, some sample students not identified by the

institution as baccalaureate candidates were determined during the CATI interview to have actually received baccalaureate degrees (false negatives) during the specified timeframe.

Table 4-21 shows that of the 11,300 students who were sampled as baccalaureate candidates and completed a CATI interview, 1,500 were not baccalaureate recipients, which is a false-positive rate of 13 percent. Conversely, of the 24,600 students who were sampled as other undergraduates and completed a CATI interview, about 500 were baccalaureate recipients, which is a false-negative rate of 2 percent. Also, of the 8,500 students who were sampled as graduates/first-professionals and completed a CATI interview, about 80 were determined to be baccalaureate recipients in 1999-2000, which is a false-negative rate of 1.0 percent. Overall, the false-negative rate was about 2 percent.

Table 4-21.—B&B determination, by student type

Stratum	Students interviewed ¹	Confirmed B&B eligibility	
		Number	Percent
Total sample	44,500	10,400	23
Baccalaureate	11,300	9,800	87
Other undergraduate	24,620	490	2
Graduate/first-professional	8,530	80	1

¹Includes all eligible sample members who completed the student interview, since confirmation of B&B eligibility status required contact with the sample members.

NOTE: To protect confidentiality, some numbers have been rounded.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

4.6 Quality of NPSAS Data

4.6.1 CATI Nonresponse Bias Analysis

Unit nonresponse causes bias in survey estimates when the outcomes of respondents and nonrespondents are different. A bias analysis was conducted to determine whether any variables were significantly biased due to CATI nonresponse. The distributions of several variables using the design-based, adjusted weights for study respondents (study weights) were found to be biased before CATI nonresponse adjustments, but the CATI nonresponse and poststratification procedures (described subsequently in Chapter 6) greatly reduced the bias for these variables. When the weighting was completed, no variables available for most respondents and nonrespondents had significant bias for all students combined.

CATI respondents and nonrespondents were characterized by comparing the weighted percentage of CATI respondents with the weighted percentage of CATI nonrespondents for each category of important characteristics known for both respondents and nonrespondents. T-tests were performed to determine whether the difference between respondents and nonrespondents was significant at the 5 percent level.

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Table 4-22 compares demographic characteristics of CATI respondents and nonrespondents for all students combined and also shows the full sample distribution. This table shows that the distributions of demographic characteristics—such as age, race, sex, student type, and receipt of aid—were significantly different for CATI respondents and nonrespondents. Some of the statistically significant differences are not large differences, but aid recipients were clearly more likely to be respondents. When the differences between CATI respondents and nonrespondents are significant, the bias is also significant, as described below.

The nonresponse bias for variables known for both respondents and nonrespondents was also estimated. The bias in an estimated mean based on CATI respondents, \bar{y}_R , was the difference between this mean and the target parameter, π , that we were trying to estimate—i.e., the mean that we would estimate if we conducted a complete census of the target population. This bias can be expressed as follows:

$$B(\bar{y}_R) = \bar{y}_R - \pi .$$

The estimated mean based on CATI nonrespondents, \bar{y}_{NR} , can be computed if we have data for the particular variable for most of the nonrespondents. An estimate of π can be derived as follows:

$$\hat{\pi} = (1 - \eta) \bar{y}_R + \eta \bar{y}_{NR} ,$$

where η is the weighted unit nonresponse rate. Therefore, the bias can be estimated as follows:

$$\hat{B}(\bar{y}_R) = \bar{y}_R - \hat{\pi} ,$$

or equivalently

$$\hat{B}(\bar{y}_R) = \eta(\bar{y}_R - \bar{y}_{NR}) .$$

This formula shows that the estimate of the nonresponse bias is the difference between the mean for CATI respondents and nonrespondents multiplied by the weighted nonresponse rate. We then computed the variance of the bias using Taylor Series estimation in RTI's software package SUDAAN.

The first set of columns in table 4-23 shows the estimated bias before CATI nonresponse adjustment and imputation for the variables available for most responding and nonresponding students. The respondent and nonrespondent counts and means do not match those in table 4-22 because table 4-22 included imputed data and table 4-23 did not include imputed data for the before-CATI nonresponse adjustment estimates. Also, no categories for missing data were included in table 4-23. A few variables have no before-CATI nonresponse adjustment results because they had high levels of missing data. T-tests were used to test each level of the variables for significance of the bias at the $0.05/(c-1)$ significance level, where c is the number of categories within the primary variable. The bias of several variables, such as sex, student type, and receipt of aid is significant, although the bias is small for some of these variables.

Table 4-22. — Comparison of NPSAS:2000 CATI respondents and nonrespondents

Variable	CATI respondents		CATI nonrespondents		Full sample	
	Sample size	Percent estimate ¹	Sample size	Percent estimate ¹	Sample size	Percent estimate ¹
Age ²						
19 or younger	6,480	19.5	2,560	19.0	9,030	19.3
20 to 23	16,140	31.2	6,290	32.2	22,420	31.5
24 to 29	9,380	19.3	4,140	21.8*	13,510	20.1
30 to 39	6,910	16.1	2,540	14.9*	9,440	15.8
40 or older	5,600	13.9	1,760	12.1*	7,360	13.4
Race ³						
White	4,980	77.7	12,840	74.2*	47,820	76.7
Black or African American	4,960	12.1	2,290	13.5	7,250	12.5
Asian	2,540	5.3	1,540	8.6*	4,080	6.3
American Indian or Alaska Native	280	0.7	180	1.2*	460	0.9
Native Hawaiian or Pacific Islander	140	0.4	150	1.0*	290	0.5
More than one race	1,600	3.8	280	1.6*	1,880	3.2
Ethnicity ³						
Not Hispanic	40,010	89.1	14,960	87.0*	54,960	88.5
Hispanic	4,490	10.9	2,320	13.0*	6,810	11.5
Sex ³						
Male	18,230	42.2	7,800	46.9*	26,030	43.6
Female	26,260	57.8	9,480	53.1*	35,740	56.4
Institution level ⁴						
4-year	33,690	57.9	11,770	51.1*	45,460	55.9
2-year	7,450	39.8	3,720	46.2*	11,170	41.7
Less-than-2-year	3,360	2.3	1,790	2.8	5,140	2.4
Institutional control ⁴						
Public	28,060	75.9	10,610	77.2	38,680	76.3
Private not-for-profit	12,540	19.6	4,580	17.7*	17,110	19.0
Private for-profit	3,890	4.5	2,090	5.1	5,980	4.7
Institutional region ⁴						
New England	2,540	5.2	1,040	5.4	3,580	5.2
Mid East	7,330	15.2	2,730	14.3	10,060	14.9
Great Lakes	7,360	15.8	2,640	14.7	10,000	15.5
Plains	3,520	7.2	1,150	6.0*	4,660	6.9
Southeast	10,010	23.0	3,440	19.4*	13,450	21.9
Southwest	4,650	11.1	2,140	13.7*	6,780	11.9
Rocky Mountain	1,850	3.9	610	3.7	2,460	3.9
Far West	6,440	17.4	3,080	21.1*	9,520	18.5
Outlying area	800	1.3	460	1.7	1,260	1.4
Student type ⁴ (sampled)						
Baccalaureate	11,340	6.9	3,700	5.7*	15,040	6.5
Other undergraduate	24,620	78.8	10,890	83.3*	35,510	80.1
Graduate	7,610	12.4	2,400	9.5*	10,010	11.6
First-professional	920	1.9	280	1.5*	1,200	1.8
Student type ³ (CADE)						
Undergraduate	35,540	85.2	14,400	88.5*	49,930	86.2
Graduate	8,040	13.0	2,600	10.1*	10,640	12.2
First-professional	920	1.8	280	1.4*	1,200	1.7
Fall enrollment status ³						
Not enrolled	7,020	18.2	3,520	22.7*	10,540	19.5
Full-time	27,730	53.7	8,990	42.7*	36,720	50.5
Half-time	5,710	15.8	2,820	18.8*	8,530	16.7
Less than half-time	4,040	12.3	1,950	15.9*	5,980	13.3

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**Table 4-22. — Comparison of NPSAS:2000 CATI respondents and nonrespondents—
Continued**

Variable	CATI respondents		CATI nonrespondents		Full sample	
	Sample size	Percent estimate ¹	Sample size	Percent estimate ¹	Sample size	Percent estimate ¹
Receipt of any aid ³						
No	18,240	48.4	8,320	56.5*	26,560	50.8
Yes		51.6	8,950	43.5*	35,200	49.3
Receipt of federal aid ³						
No	24,140	60.4	10,320	66.9*	34,460	62.3
Yes	20,350	39.6	6,960	33.1*	27,300	37.7
Receipt of state aid ³						
No	37,920	85.2	15,230	87.8*	53,140	85.9
Yes	6,580	14.8	2,050	12.2*	8,630	14.1
Receipt of institutional aid ³						
No	34,040	82.8	14,070	86.8*	48,110	84
Yes	10,450	17.2	3,210	13.2*	13,660	16
Applied for federal aid ⁶						
No	21,000	51.9	9,270	59.1*	30,270	54
Yes	23,500	48.2	8,010	40.9*	31,500	46
Receipt of Pell Grant ⁷						
No	34,760	79.9	13,460	81.7*	48,220	80.4
Yes	9,730	20.1	3,820	18.3*	13,550	19.6
Pell grant amount received ⁷						
Less than or equal to \$1,183	2,480	29.5	910	28.9	3,390	29.3
\$1,184 to \$1,953	2,400	23.2	1,020	24.5	3,420	23.6
Greater than \$1,953	4,860	47.3	1,880	46.6	6,740	47.1
Receipt of Stafford loan ⁷						
No	28,310	70.5	12,050	76.3*	40,360	72.2
Yes	16,180	29.5	5,230	23.7*	21,410	27.8
Stafford Loan amount received ⁷						
Undergraduate						
Less than or equal to \$2,625	3,710	32.7	1,340	33.1	5,060	32.8
\$2,626 to \$4,425	3,000	22.4	1,020	23.2	4,020	22.6
\$4,426 to \$5,500	3,860	22.2	1,080	20.0*	4,940	21.7
Greater than \$5,500	3,080	22.8	1,060	23.7	4,140	23
Graduate/first-professional						
Less than or equal to \$8,000	640	23.4	190	23.4	830	23.4
\$8,001 to \$12,521	620	23.3	180	23.7	800	23.4
\$12,522 to \$18,500	950	39.9	260	37.5	1,210	39.4
Greater than \$18,500	320	13.4	110	15.5	430	13.9

¹ Using the final study weights and imputed data.

² Primary data sources are CADE and CPS.

³ Primary data source is CADE.

⁴ Primary data source is sampling frame.

⁵ Primary data source is CATI control system.

⁶ Primary data source is CPS.

⁷ Primary data source is NSLDS.

*Difference between CATI respondents and nonrespondents is significant at the 0.05/(c-1) level, where c is the number of categories within the primary variable.

NOTE: To protect confidentiality, some numbers have been rounded. Some percentages may not sum to totals for a variable due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Weight adjustments are typically used to reduce bias due to unit nonresponse, and the results in tables 4-22 and 4-23 show that these adjustments are important for reducing the

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potential for nonresponse bias due to the differences between CATI respondents and nonrespondents. All variables that were thought to be predictive of CATI nonresponse and were missing for 5 percent or fewer of all study respondents, which included many of the variables identified in tables 4-22 and 4-23, were incorporated into the initial nonresponse models. Pell grant status and Stafford loan status were determined to be important predictors of federal aid receipt, so these variables were retained in all nonresponse models to preserve the population totals of these predictor variables. Additionally, institution type and student type were retained in all nonresponse models. The three stages of CATI nonresponse adjustment were

1. inability to locate the student,
2. refusal to be interviewed, and
3. other non-interview.

Weights were adjusted for the potential bias resulting from the three different types of CATI nonresponse. Poststratification to control totals adjusted for the potential for bias resulting from frame errors. The control totals included totals of study weights for seven variables with little missing data. All nonresponse adjustment and poststratification models were fit using RTI's generalized exponential models (GEMs),⁶ which are similar to logistic models using bounds for adjustment factors. (Section 6.1 describes all the weighting details.)

The second set of columns in table 4-23 shows the estimated bias after weight adjustments for the variables available for most responding and nonresponding students. Four variables had zero bias after weight adjustments because we controlled to totals for these variables. The bias decreased after weight adjustments for all variables, except for some of the Pell Grant and Stafford Loan amount categories. The bias is not significant for these categories, and this increase occurred because we poststratified to Pell Grant and Stafford Loan amounts by sector (different categories than shown in the table). Although table 4-23 shows that some bias remained after all weight adjustments for a few variables, the magnitude of the residual bias shown in this table is small. The data available for these variables were insufficient to eliminate the bias altogether. Additional information on the nonresponse bias analysis will be described in a separate bias analysis report.⁷

⁶ R.E. Folsom, and A.C. Singh. "The Generalized Exponential Model for Sampling Weight Calibration for Extreme Values, Nonresponse, and Poststratification." *Proceedings of the Section on Survey Research Methods of the American Statistical Association*, 2000, 598–603.

⁷ U.S. Department of Education, National Center for Education Statistics. National Postsecondary Student Aid Study, 1999-2000 (NPSAS:2000), CATI Nonresponse Bias Analysis Report, NCES 2002-03, by Peter H. Siegel, Roy W. Whitmore, Ruby E. Johnson, and Di Yu. Andrew G. Malizio, project officer. Washington, DC: 2000.

Table 4-23.—Nonresponse bias before CATI nonresponse adjustment and after weight adjustments for selected variables for all students

Description	Before CATI nonresponse adjustment—unimputed data						After weight adjustments—imputed data			
	CATI unweighted respondents	CATI unweighted nonrespondents	CATI respondent mean, study weights	CATI nonrespondent mean, study weights	Estimated bias	Mean, CATI weights	Mean, study weights	Estimated bias	Estimated bias	
Student's age	44,430	17,000	27.4	27.0	0.1140 ¹	27.3	27.2	0.0319		
Student age groups										
	6,470	2,510	19.5	18.9	0.2000	19.4	19.3	0.0650		
	16,120	6,160	31.2	32.0	-0.2000	31.3	31.5	-0.1470		
	9,360	4,100	19.3	22.0	-0.8000 ¹	20.1	20.1	0.0260		
	6,890	2,500	16.1	14.9	0.4000 ¹	15.6	15.8	-0.1820		
	5,590	1,730	13.9	12.2	0.5000 ¹	13.6	13.4	0.2370		
Has student received any type of aid?	26,250	8,950	51.6	43.5	2.3000 ¹	49.3	49.3	0.0060		
	18,240	8,320	48.4	56.5	-2.3000 ¹	50.8	50.8	-0.0060		
Did student attend institution in the fall?	27,610	8,640	53.7	42.0	3.3000 ¹	50.4	50.5	-0.0740		
	5,670	2,720	15.8	18.8	-0.8000	16.6	16.7	-0.0560		
	4,000	1,900	12.2	16.0	-1.1000 ¹	13.3	13.3	-0.0290		
	7,020	3,520	18.3	23.2	-1.4000 ¹	19.7	19.5	0.1590		
Attendance										
	†	†	†	†	†	36.9	37.4	-0.4720 ³		
	†	†	†	†	†	16.5	16.5	0.0050		
	†	†	†	†	†	21.1	21.3	-0.2740		
	†	†	†	†	†	25.5	24.8	0.7410 ²		
Citizenship status	39,660	14,550	93.0	90.3	0.8000	92.2	92.1	0.0860		
	1,680	880	4.4	5.1	-0.2000	4.6	4.6	-0.0120		
	1,490	1,100	2.6	4.6	-0.6000 ¹	3.2	3.3	-0.0740		
CPS match	23,500	8,010	48.2	40.9	2.1000 ¹	46.1	46.0	0.0560		
	21,000	9,270	51.9	59.1	-2.1000 ¹	53.9	54.0	-0.0560		
Dependency status – two-level	†	†	†	†	†	44.3	42.8	1.5170 ^{2,3}		
Dependency status – three-level	†	†	†	†	†	55.7	57.2	-1.5170 ^{2,3}		
	†	†	†	†	†	44.3	42.8	1.5170 ^{2,3}		
	†	†	†	†	†	27.2	29.4	-2.2180 ²		
Enrollment total at the student's institution	44,490	17,280	16423.5	†	†	28.5	27.8	0.7010 ²		
Enrollment categories ⁴	10,690	4,250	17.2	17296.3	-253.1520 ¹	16673.9	16676.7	-2.7413		
	11,570	4,180	28.1	15.3	0.5000 ¹	16.6	16.6	-0.0530		
	11,060	4,490	28.8	26.6	0.5000	27.9	27.7	0.1890		
Was the student enrolled in institution in the fall?	36,410	13,520	79.7	76.2	0.5300 ¹	78.6	78.7	-0.1110		
	1,060	240	2.1	1.1	1.0270 ¹	1.8	1.8	-0.0480		
Did the student receive any federal financial aid?	7,020	3,520	18.2	22.7	-1.3100 ¹	19.7	19.5	0.1590		
	20,350	6,960	39.6	33.1	1.8930 ¹	37.8	37.7	0.0280		
Student's sex	24,140	10,320	60.4	66.9	-1.8930 ¹	62.2	62.3	-0.0280		
	17,870	7,750	42.2	46.9	-1.3980 ¹	43.5	43.6	-0.0310		
	25,780	9,420	57.8	53.1	1.3980 ¹	56.5	56.4	0.0310		

Table 4-23.— Nonresponse bias before CATI nonresponse adjustment and after weight adjustments for selected variables for all students —Continued

Description	Response	Before CATI nonresponse adjustment—unimputed data				After weight adjustments—imputed data			
		CATI unweighted nonrespondents	CATI unweighted nonrespondents	CATI respondent mean, study weights	CATI nonrespondent mean, study weights	Estimated bias	Mean, CATI weights	Mean, study weights	Estimated bias
Did the student receive any Institution financial aid? Institution region	Yes	10,450	3,210	17.2	13.2	1.1610 ¹	16.0	16.0	0.0200
	No	34,040	14,070	82.8	86.8	-1.1610 ¹	84.0	84.0	-0.0200
	New England	2,540	1,040	5.2	5.4	-0.0520	5.3	5.2	0.0470
	Mid East	7,330	2,730	15.2	14.3	0.2610	14.9	14.9	-0.0030
	Great Lakes	7,360	2,640	15.8	14.7	0.2900	15.7	15.5	0.2500
	Plains	3,520	1,150	7.2	6.0	0.3500 ¹	7.0	6.9	0.1590
	Southeast	10,010	3,440	23.0	19.4	1.0300 ¹	22.1	21.9	0.1080
	Southwest	4,650	2,140	11.1	13.7	-0.7500 ¹	11.9	11.9	0.0410
	Rocky Mountain	1,850	610	3.9	3.7	0.0600	3.9	3.9	0.0040
	Far West	6,440	3,080	17.4	21.1	-1.0700 ¹	17.8	18.5	-0.6260 ²
	Outlying area	800	460	1.3	1.7	-0.1100	1.5	1.4	0.0190
	Yes	9,730	3,820	20.1	18.3	0.5400 ¹	19.6	19.6	0.0000
	Did the student receive any Pell grants?	No	34,760	13,460	79.9	81.7	-0.5400 ¹	80.4	80.4
Pell amount <= \$1,183		2,480	910	29.5	28.9	0.1500	29.5	29.3	0.1880
\$1,183 < Pell amount <= \$1,953		2,400	1,020	23.2	24.5	-0.3400	23.2	23.6	-0.3300
\$1,953 < Pell amount		4,860	1,880	47.3	46.6	0.1900 ¹	47.2	47.1	0.1410
		9,730	3,820	1911.2	1909.3	0.5098	1910.7	1910.7	0.0000
Public, less-than-2-year		740	320	0.6	0.6	0.0000	0.6	0.6	0.0000
Public, 2-year		5,950	2,980	37.6	43.8	-1.8000 ¹	39.4	39.4	0.0000
Public, 4-year, non-doctorate-granting		6,730	2,230	12.7	10.4	0.6800 ¹	12.0	12.0	0.0000
Public, 4-year, doctorate-granting		14,640	5,090	25.0	22.4	0.7500 ¹	24.3	24.3	0.0000
Private, not-for-profit 2-year or less		980	530	0.7	0.8	-0.0400	0.7	0.7	0.0000
What was the amount of the Pell grant received? Institution sector	Private, not-for-profit 4-year, non-doctorate-granting	5,410	1,780	9.4	8.2	0.3600 ¹	9.1	9.1	0.0000
	Private, not-for-profit 4-year, doctorate-granting	6,150	2,260	9.5	8.7	0.2400	9.3	9.3	0.0000
	Private, for-profit less-than-2-year	2,350	1,290	1.6	2.0	-0.1000	1.7	1.7	0.0000
	Private, for-profit 2-year	780	390	1.6	1.7	-0.0300	1.7	1.7	0.0000
	Private, for-profit 4-year	760	410	1.2	1.4	-0.0600	1.3	1.3	0.0000
	Single	†	†	†	†	†	73.0	74.0	-1.0010 ^{2,3}
	Married	†	†	†	†	†	25.7	24.6	1.0590 ²
	Separated	†	†	†	†	†	1.3	1.4	-0.0580
	UG and Stafford amt <= \$2,625	3,710	1,340	27.8	28.7	-0.2200	28.2	28.0	0.1970
	UG and \$2,625 < Stafford amount <= \$4,425	3,000	1,020	19.0	20.1	-0.2700	19.1	19.3	-0.2630
Stafford categories for all Stafford recipients ⁵	UG and \$4,425 < Stafford amount <= \$5,500	3,860	1,080	18.9	17.4	0.3800	18.8	18.5	0.2970
	UG and \$5,500 < Stafford amount	3,080	1,060	19.4	20.6	-0.3000	19.6	19.7	-0.0500
	GR/FP and Stafford amt <= \$8,000	640	190	3.5	3.1	0.0900	3.3	3.4	-0.1320
	GR/FP and \$8,000 < Stafford amount <= \$12,521.50	620	180	3.5	3.1	0.0800	3.3	3.4	-0.1110
	GR/FP and \$12,521.50 < Stafford amount <= \$18,500	950	260	5.9	5.0	0.2400	5.7	5.7	0.0330
	GR/FP and \$18,500 < Stafford amount	320	110	2.0	2.0	-0.0100	2.0	2.0	0.0300

Table 4-23.— Nonresponse bias before CATI nonresponse adjustment and after weight adjustments for selected variables for all students —Continued

Description	Before CATI nonresponse adjustment—unimputed data					After weight adjustments—imputed data			
	CATI unweighted respondents	CATI unweighted nonrespondents	CATI respondent mean, study weights	CATI nonrespondent mean, study weights	Estimated bias	Mean, CATI weights	Mean study weights	Estimated bias	
Amount of Stafford Loan received	16,180	5,230	6014.3	5839.6	43.1473	5,990.5	5971.2	19.2861	
Did the student receive a Stafford Loan?	16,180	5,230	29.5	23.7	1.6900 ¹	27.7	27.8	-0.0890	
Did the student receive any state Financial aid?	28,310	12,050	70.5	76.3	-1.6900 ¹	72.3	72.2	0.0890	
Student type – sampled	Yes	6,580	14.8	12.2	0.7500 ¹	14.1	14.1	0.0180	
	No	37,920	15,230	85.2	87.8	-0.7500 ¹	85.9	85.9	-0.0180
Student type – CADE	Baccalaureate	11,340	3,700	6.9	5.7	0.3400 ¹	6.4	6.5	-0.1510 ^{2,3}
	Other undergraduate	24,620	10,890	78.8	83.3	-1.3000 ¹	80.2	80.1	0.0830
	Graduate	7,610	2,400	12.4	9.5	0.8300 ¹	11.7	11.6	0.1120
	First-professional	920	280	1.9	1.5	0.1200 ¹	1.7	1.8	-0.0430
	Undergraduate	35,540	14,400	85.2	88.5	-0.9700 ¹	86.2	86.2	0.0000
Graduate	8,040	2,600	13.0	10.1	0.8400 ¹	12.2	12.2	0.0000	
First-professional	920	280	1.8	1.4	0.1400 ¹	1.7	1.7	0.0000	

[†]The distribution based on the CATI weights is significantly different at the 0.05 level from the distribution based on the study weights.

¹Bias is significant at the 0.05/(c-1) level, where c is the number of categories within the primary variable.

²Bias is likely significant at the 0.05/(c-1) level, where c is the number of categories within the primary variable.

³Before-CATI nonresponse adjustment results were not completed because of the high level of nonresponse (i.e., greater than 5 percent) associated with the variable and only variables known for most respondents and nonrespondents were included in this analysis.

⁴Enrollment categories were defined by quartiles.

⁵UG = undergraduate, GR = graduate, and FP = first-professional.

4.6.2 CATI Data Indeterminacies

Special keyed entry (F3 or F4 key) allowed the CATI interviewers to accommodate responses of “don’t know” and “refusal” to every item. Refusal responses to interview questions were most common for items considered sensitive by respondents, while don’t know responses may have resulted from a number of circumstances. The most obvious reason a respondent will offer a don’t know response is that the answer is truly unknown or in some way inappropriate for the respondent. Don’t know responses may also be evoked when (1) question wording is not understood by the respondent (with no explanation by the interviewer), (2) the respondent hesitates to provide a “best guess” response (with insufficient prompting from the interviewer), and (3) a respondent implicitly refuses to answer a question. Refusal and don’t know responses introduce indeterminacies in the data set and must be resolved by imputation or subsequently dealt with during analysis.

Overall item nonresponse rates in the NPSAS:2000 interview were low, with only 38 items (of approximately 575 CATI items) containing over 10 percent missing data. These items are shown in table 4-24, and are grouped by interview section.

Item nonresponse rates were calculated based on the number of sample members for whom the item was applicable and asked. Items with the highest rates of nonresponse were those pertaining to graduate admissions test scores. Between 47 and 49 percent of respondents who were asked to report scores on the various sections of the Graduate Record Exam (GRE) gave don’t know responses or refused to answer. The same pattern was evident with the other test scores collected, but less pronounced, with 34 percent and 25 percent providing don’t know or refusal responses for the Graduate Management Admission Test (GMAT) and Law School Admissions Test (LSAT), respectively. The other type of item with a high rate of indeterminacy collected information about income and assets, as well as details of financial aid, including sources of grants and amounts borrowed. Many respondents were reluctant to provide information about personal and family finances. These items were more likely to be indeterminate due to refusals.

4.6.3 Interviewer Use of Online Help Text

Online help text was available for every screen in the CATI instrument. Having additional information available at the touch of a key (F10) was very beneficial to interviewers, particularly at the beginning of data collection, to immediately alleviate any confusion with questions while they were still on the telephone with the respondent. Help-text screens displayed information designating to whom the item applied, type of information that was requested in the item, and definitions of words or phrases in the item.

Counters were used to determine the number of times each help screen was accessed, making it possible to identify items that were confusing to interviewers or respondents. Table 4-25 presents CATI items having the highest rates of help-text usage, along with their rates of indeterminacy. An analysis of the number of help-text accesses revealed 36 (of approximately 575 CATI items) for which the help text was accessed more than 100 times.

The items pertaining to the lifetime learning tax credit, the Hope scholarship, and plans to use either tax credit in the year 2000 had the greatest number of accesses to help text. These

items also had high rates of indeterminacy, suggesting that both interviewers and respondents were largely unfamiliar with these new tax credits. It is also likely that students' parents were claiming the tax credits rather than the students themselves, which could explain the high rate of DK responses despite the fact that interviewers used the help text to explain what the credit was. The help text included a thorough explanation of the tax credits as well as Web site information so respondents could learn more about them.

4.6.4 CATI Online Coding

The NPSAS:2000 instrument included tools that allowed computer-assisted online assignment of codes to literal responses for postsecondary education institutions attended, major field of study, occupation, and industry. Online coding systems were designed to improve data quality by capitalizing on the availability of the respondent to clarify coding choices at the time the coding was performed. To assist with the online coding process, interviewers were trained to use effective probing techniques to ensure each response was appropriately coded. Interviewers could request clarification or additional information if a particular text string could not be successfully coded on the first attempt, an advantage not possible when coding occurs after an interview is complete. Because both the literal string and selected code were captured in the data file for field of study and occupation/industry responses, subsequent quality control recoding by project staff was easily incorporated into data collection procedures.

Institutional coding was used to assign a six-digit IPEDS identifier for each postsecondary institution the respondent reported attending. To facilitate coding, the IPEDS coding system asked for the state in which the institution was located, followed by the city, and finally the name of the postsecondary institution. The system relied on a look-up table, or coding dictionary, of institutions which was constructed from the 1997–98 IPEDS IC file. Additional information in the dictionary, such as institutional level and control, was retrieved for later use (e.g., branching) once the institution was properly coded.

Table 4-24.—Student interview item nonresponse for items with more than 10 percent “don’t know” or “refused”

CATI section and variable name ¹	CATI variable label	Unweighted				Weighted combined percent
		Number asked	Percent don’t know	Percent refused	Combined percent	
Section A: Eligibility and enrollment						
NAGPA	Cumulative GPA	40,428	12.1	0.6	12.7	15.1
NAMAJGPA	Major GPA	9,547	16.7	0.8	17.5	17.6
Section B: Student background						
NBRACESP	Specify race (respondent)	100	7.0	3.0	10.0	7.6
NBARRVF	Year father arrived in US	6,890	15.8	1.0	16.8	18.0
NBARRVM	Year mother arrived in US	7,303	12.9	1.1	14.0	15.4
NBDADAS	Father earned associate’s degree	3,201	10.1	0.3	10.4	11.6
Section C: Financial aid						
NCOTHGT1	Other grant 1-TARGET ²	311	11.6	1.3	12.9	12.3
NCSRCT1	Source of grant/scholarship 1-TARGET ²	312	9.9	1.6	11.5	11.5
NCAMTT1	Amount of grant/scholarship-1-TARGET ²	312	19.9	1.9	21.8	21.0
NCOTHGT2	Other grant 2-TARGET ²	110	11.8	2.7	14.6	13.2
NCSRCT2	Source of grant/scholarship 2-TARGET ²	110	11.8	2.7	14.6	13.1
NCOTHG11	Other grant 1-school 1 ²	373	13.7	1.1	14.8	16.1
NCSRCT1	Source of grant/scholarship 1-school 1 ²	372	11.3	1.1	12.4	14.7
NCAMT11	Amount of grant/scholarship-1-school 1 ²	372	19.9	1.9	21.8	23.0
NCHOPE	Use Hope scholarship	11,386	15.3	0.5	15.8	14.3
NCLIFTIM	Use lifelong learning tax credit	24,153	14.6	0.7	15.3	14.8
NCCRD00	Plan to claim tax credit in 2000	6,597	15.1	0.3	15.4	15.3
NCSUPEST	Estimate support-nontuition expenses	1,171	8.3	2.7	10.9	13.3
Section D: Employment and income						
NDEARN	Earnings from working while enrolled	34,259	8.5	4.4	12.9	13.3
NDHRSEXP	Hours expected to work	7,577	15.7	0.7	16.4	15.8
NDINC99	Earnings this calendar year	43,937	8.6	4.5	13.1	13.7
NDINC98	Earnings in 1998	9,700	8.9	3.9	12.8	13.7
NDINCS99	Spouse’s earnings in 1999	13,099	10.1	8.8	18.9	19.6
NDINCS98	Spouse’s earnings in 1998	2,761	21.0	17.9	38.9	41.3
NDOINC99	Total income–1999	42,055	11.8	1.4	13.2	13.3
NDOINC98	Total income–1998	5,798	12.4	1.6	14.0	14.9
NDPARINC	Parents’ income–1999	7,450	14.1	4.6	18.7	20.5
NDBSEST	Business value over \$10,000	259	12.7	16.2	29.0	33.0
NDINEST	Value of other investments over \$10,000	709	10.3	26.4	36.7	35.8
NDINVAL	Total value of other investments	3,593	9.3	10.4	19.7	19.4
NDCASH	Total cash and savings	18,670	8.0	13.2	21.3	21.6
NDCRDBAL	Balance due on all credit cards	15,253	8.4	5.2	13.5	14.0
Section E: Education experiences						
NEGREA	GRE score–analytic	4,053	46.4	2.6	49.1	52.7
NEGREM	GRE score–math	4,033	44.2	2.4	46.6	50.1
NEGREV	GRE score–verbal	4,057	44.0	2.9	46.8	49.9
NEGMAT	GMAT score–total	857	31.2	2.8	34.0	34.0
NELSAT	LSAT score	770	20.4	4.7	25.1	26.2
Section G: Locating information						
NGIDYES	Will provide student ID number	3,096	19.0	5.8	24.8	24.7

¹ CATI items are presented in instrument order, by section.

² Some students attended more than one institution during the NPSAS year. In such cases, the institution at which the student had received a degree or was working toward a degree was identified as the target institution. For each institution attended, information was collected on up to three grants or scholarships. These items were not asked at any institution if the information was already available from CADE.

NOTE: Statistics are based on student sample members for whom specific items were applicable and were asked. Items applicable to fewer than 100 sample members were excluded from consideration.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

4. Evaluation of Operations and Data

Table 4-25.—Item-level rates of help text access for items for which help was accessed more than 100 times

CATI section and variable name ¹	CATI variable label	Frequency asked in CATI ²	Help count ³	Rate of help text access ⁴	Combined indeterminacy rate ⁵
Section A: Eligibility and enrollment					
NADEGN	Degree program at NPSAS school	44,486	154	0.3	0.5
NAUGYR	Undergraduate year	35,522	109	0.3	1.2
NAGPA	Cumulative GPA	40,428	154	0.4	12.7
Section B: Student background					
NBOTDEPS	Has dependents other than children	41,008	131	0.3	0.2
NBPOLIT	Attend political meetings	38,289	218	0.6	0.4
NBGUARD	Legal guardian other than parent	28,325	207	0.7	0.3
NBPRHSD	Number of dependents-parent household	28,242	180	0.6	1.6
Section C: Financial aid					
NCRCVAID	Received financial aid	36,795	109	0.3	0.1
NCOTAIDN	Receive other aid-NPSAS	44,204	309	0.7	0.6
NCFAMLN	Amount borrowed from family/friends	36,694	164	0.4	4.4
NCFAMN99	Amount borrowed-family/friends-NPSAS	40,893	250	0.6	3.1
NCUGLN	Amount borrowed for undergraduate loans	44,193	315	0.7	4.8
NCFEDUGL	Amount borrowed in fed undergrad loans	19,133	627	3.3	7.3
NCPARTUI	Parents helped pay tuition	30,496	136	0.4	0.5
NCSCHSUP	Support for school expenses-not tuition	30,491	400	1.3	0.4
NCSUPAMT	Amount-support for non-tuition expenses	30,490	173	0.6	4.3
NCHOPE	Use Hope scholarship	11,386	647	5.7	15.8
NCLIFTIM	Use lifelong learning tax credit	24,153	1,652	6.8	15.3
NCCRD00	Plans to take tax credit in 2000	6,597	716	10.9	15.4
Section D: Employment and income					
NDNUMJOB	Number of jobs during NPSAS year	44,074	265	0.6	0.2
NDOCCENR	Occupation: duty string	34,310	147	0.4	0.6
NDEMPTYTYP	Type of employer	31,534	449	1.4	1.5
NDEARN	Earnings from working while enrolled	34,259	249	0.7	12.9
NDLICENS	Number of licenses held	40,675	378	0.9	0.2
NDDEP99	Respondent claimed as a dependent-1999	18,722	211	1.1	4.1
NDINC99	Earnings this calendar year	43,937	241	0.5	13.1
NDINC98	Earnings in 1998	9,700	101	1.0	12.8
NDOINC99	Total income-1999	42,055	1,125	2.7	13.2
NDUNTAX	Receive untaxed benefits in 1999	43,912	181	0.4	1.0
NDCASH	Total cash and savings	18,670	343	1.8	21.3
NDNUMCRD	Number of credit cards in own name	40,593	306	0.8	2.2
Section E: Education experiences					
NEREMEVN	Taken remedial courses	40,571	392	1.0	0.2
NEGRE	Take GRE	22,551	122	0.5	0.3
Section F: Disabilities					
NFDISOTH	Physical/mental/emotional disability	43,841	125	0.3	0.2
NFMAIN	Main limiting condition	4,059	162	4.0	1.5
NFVOCREC	Ever received vocational rehab services	41,188	246	0.6	0.0

¹ CATI items are presented in instrument order, by section.

² This column represents the number of times each CATI item was administered.

³ This column represents the number of times that interviewers accessed help text while conducting interviews with respondents.

⁴ The rate presented is expressed as a percentage and computed as the number of times the help text for each item was accessed, divided by the number of times that particular item was administered, multiplied by 100.

⁵ The rate of indeterminacy is the number of “don’t know” and “refused” responses divided by the number of times the item was administered, multiplied by 100.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Major field of study, occupation, and industry coding used a dictionary of word/code associations. The online procedures for these coding operations consisted of four steps: (1) the interviewer keyed the verbatim text provided by the respondent; (2) the dictionary system displayed words that were associated with the words in the text string and the interviewer was given the choice of either accepting a word that might help in terms of coding, or ignoring a word that was of no help; (3) standard descriptors associated with identified codes were displayed for the interviewer; and (4) the interviewer selected a standard descriptor that was listed, with assistance from the respondent if needed.

Several steps were taken after data collection to ensure the completion and accuracy of the online coding procedures. The first step was upcoding, where project staff reviewed all of the literal strings that were “uncodeable” by the telephone interviewers and coded the strings into the appropriate categories. Table 4-26 presents the proportion of coding attempts that were uncodeable by interviewers but were subsequently coded by project staff.

Institutional coding was the most initially uncodeable field, and also had the lowest rate of successful coding after the upcoding procedure. This is largely due to the different manner in which institutions were coded. IPEDS coding required a precise match between the name of the institution entered and the IPEDS database, while major field, industry, and occupation were coded by assigning verbatim strings to categories, or standard descriptors. To code institutions, respondents provided the state, city, and name of the institution, and the code was assigned once a match was found from the 1997-98 IPEDS IC file. An institution remained uncodeable if there was not an exact match in the database, whereas a major, occupation, or industry could be coded more easily into a category. Another factor contributing to the high rate of uncodeable institutions is that there were a number of foreign institutions attended by respondents. Foreign institutions were not included in the IPEDS database, and thus were not codeable either online or during post-data collection coding procedures.

Of the remaining codeable fields, very few literal strings given by respondents were uncodeable. Occupation had an uncodeable rate of 2 percent, while industry and major both had less than 1 percent initially uncodeable. However, project staff were able to successfully code virtually all of the initially uncodeable strings.

Table 4-26.—Success of online coding procedures: Upcoding

Coding procedure	Total coding attempts*	Number originally uncodeable	Percent originally uncodeable	Percent successfully coded
IPEDS	72,468	3,822	5.3	96.5
Major field of study	37,779	192	0.5	99.9
Occupation	86,021	1620	1.9	99.9
Industry	21,583	133	0.6	99.9

*Because these items may have been asked multiple times in an interview, the total number of coding attempts may exceed the total number of completed interviews.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

4. Evaluation of Operations and Data

The second step to ensure data quality was the recoding process. Ten percent⁸ of the major, occupation, and industry coding results were sampled and evaluated. The verbatim strings were evaluated for completeness and appropriateness of the assigned codes. Upon review of the string and assigned code, project staff sometimes determined that a different code should be assigned. Table 4-27 presents the results of the evaluation of the online coding procedures. Industry was the item with the highest recode rate. Of the industry coding attempts sampled, 7.5 percent were recoded, or assigned to a different category. Occupation also required 7 percent of the sampled cases to be recoded. Major field of study had a lower recode rate at 5 percent. However, none of the recodes resulted in a broad shift across categories. Rather, recoding helped to fine tune a code assignment that was close but not completely accurate.

Table 4-27.—Success of online coding procedures: Recoding

Coding procedure	Total coding attempts*	Coding attempts sampled	Number of sample cases recoded	Percent of sample cases recoded
Major field of study	37,779	3,797	208	5.5
Occupation	87,021	8,582	607	7.1
Industry	21,583	2,076	155	7.5

*Because these items may have been asked multiple times in an interview, the total number of coding attempts may exceed the total number of completed interviews.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

4.6.5 CATI Quality Circle Meetings

Quality circle meetings were an integral tool used throughout NPSAS: 2000 full-scale data collection to evaluate project operations. During these regularly scheduled meetings, interviewers, supervisors, team leaders, and project technical staff met to discuss issues pertinent to data collection such as tracing/locating respondents and conducting CATI interviews in an efficient, but effective manner. During the first 4 weeks of data collection, quality circle meetings were scheduled once a week; afterward, every other week. To ensure that each NPSAS telephone interviewer would have an opportunity to attend at least two sessions, meetings were scheduled on alternating days of the week, as well as weekends, to maximize the chances of including telephone interviewers who only worked on certain days and/or shifts. After each meeting, quality circle minutes were compiled and distributed among the telephone interviewers for their reference.

The quality circle meetings were instrumental in providing prompt and precise solutions to problems encountered by the interviewers, whose experiences with respondents were invaluable to project staff. Several modifications were made to the CATI instrument as a result of these meetings. Types of issues raised during the quality control meetings were as follows.

⁸ Not every item was applicable to all respondents. The 10 percent sample was drawn from all instances in which a valid literal string was coded by the telephone interviewer. Uncodeable strings were treated separately.

Instrument changes/fixes. Telephone interviewers were notified when any change was made to the instrument such as question wording, new or added response options, or a fix that was implemented a result of an earlier CATI bug.

Revising help text. Additional help text was added to some questions to aid telephone interviewers in coding, or in answering questions that a respondent may have had. This added text could have been either a definition of a term that was mentioned in the question, or helpful examples of items that should/should not be included when coding.

Reviewing/entering case-level comments. The importance of reviewing and entering comments pertaining to contacting attempts for each sample member was stressed throughout data collection. Telephone interviewers were encouraged to always check the record of calls to see what happened previously on a particular case. This enabled them to contact the respondent at the appropriate time and phone number. By entering effective comments, they created a detailed description of events that would be helpful to anyone who accessed the case.

Problem sheets. Telephone interviewers could report CATI or interviewing problems electronically by submitting a problem sheet. Project staff reviewed these problem sheets in order to determine what issues were troubling interviewers. Problems that were prevalent were addressed in the quality circle meetings and in the quality circle minutes.

Coding. Considerable emphasis was placed on properly coding responses. Since most respondents did not give verbatim responses that exactly matched our response categories, telephone interviewers were instructed on how to fit those responses into the “best” possible category. In addition, telephone interviewers were also given helpful tips on how/how not to code items in the online coding system.

4.6.6 CATI Quality Control Monitoring

Monitoring of telephone data collection leads to better interviewing and better-quality survey data as well as to improvements in costs and efficiency in telephone facilities. Monitoring in the NPSAS:2000 helped to meet four important quality objectives: (1) reduction in the number of interviewer errors; (2) improvement in interviewer performance by reinforcement of good interviewer behavior; (3) assessment of the quality of the data being collected; and (4) evaluation of the overall survey design for full-scale implementation.

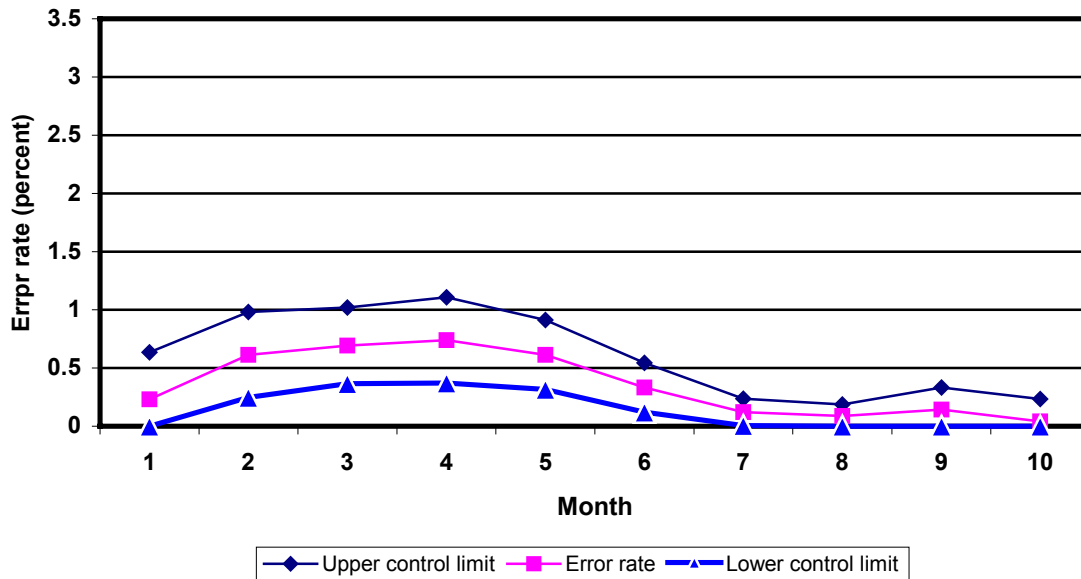
Monitors listened to up to 20 questions as the interviews were in progress and, for each question, evaluated two aspects of the interviewer-respondent interchange: whether the interviewer (1) delivered the question correctly and (2) keyed the appropriate response. Each of these measures was quantified, and daily, weekly, and cumulative reports were produced for the study’s IMS. During the data collection period, 49,096 items were monitored. The majority of the monitoring was conducted during the first half of data collection. Toward the end of data collection, monitoring efforts were scaled back due to the lighter caseload being worked by telephone interviewers, the greater experience of the remaining interviewers, and the satisfaction by project staff that the process was proceeding smoothly. Figure 4-4 shows error rates for

question delivery; figure 4-5 shows error rates for data entry. Both presentations provide upper and lower control limits for these measures.⁹

4.6.7 Reliability of Interview Responses

During instrument development for the NPSAS:2000 full-scale study, project staff developed a short computer-assisted telephone reinterview to assess the reliability of key interview items (see appendix F for a copy of the reliability reinterview). This reinterview was then administered to a randomly selected subsample of NPSAS:2000 interview respondents in order to assess the short-term temporal stability, which is a measure of reliability, of these instrument items. During data collection for the reliability assessment, a subsample of 275 CATI interview respondents was asked to participate in the reinterview process. From this group, 235 reinterviews were completed, resulting in an 85.5 percent response rate for the reinterview. The reliability statistics presented in this section are based on these 235 respondents. Sample member recontacting took place at least 3 weeks after the initial interview. Reinterviewing began on October 16, 2000. The period between the initial interview and the subsequent reliability reinterview ranged from 21 to 234 days, with an average of approximately 90 days.

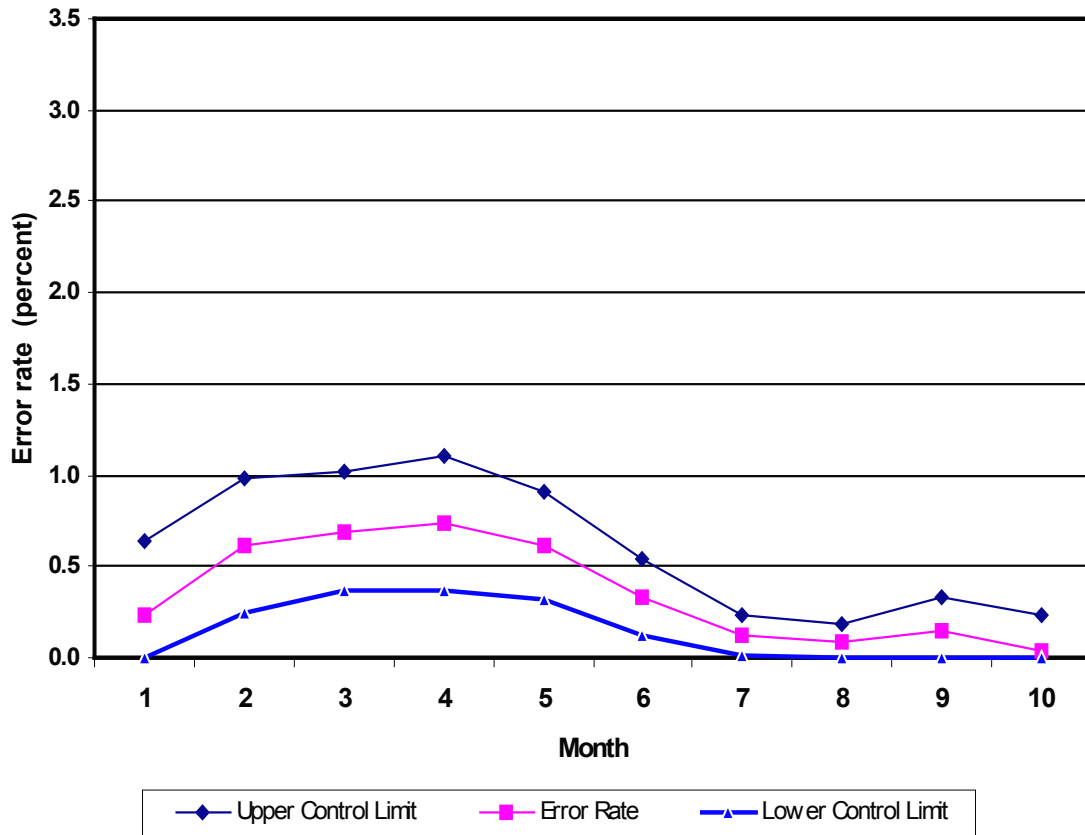
Figure 4-4.—Monitoring error rates for CATI question delivery



SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

⁹ The upper and lower control limits were defined by three times the standard error of the proportion of errors to the number of questions observed for the period (+3 times the standard error for the upper limit; -3 times the standard error for the lower limit).

Figure 4-5. — Monitoring rates for CATI data entry



NOTE: The upper and lower control limits were defined by three times the standard error of the proportion of errors to the number of questions observed for the period (+3 times the standard error for the upper limit; -3 times the standard error for the lower limit).

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Reliability, as examined here, involves the stability of responses over time (i.e., temporal consistency); consequently, analyses generally focus on data items that are expected to be stable for the period between the initial interview and the reinterview (e.g., factual rather than attitudinal data). The design of the reinterview study called for reinterviews to be conducted within 2 months of the initial interview, allowing enough time for respondents to forget their previous answers but not enough time so that actual changes in status would make accurate answering produce different responses. Unfortunately, time delays in conducting the reinterviews may have contributed to the occurrence of real change (between the interview and reinterview) in the status of the information requested of some respondents. Therefore, for certain items, any instability or unreliability suggested by these analyses may be due to real differences that have occurred between the two interviews.

Responses in the initial interview and the reinterview were compared using two measures of temporal stability for all paired responses. The first, *percent agreement*, was determined in

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one of two ways. For categorical variables, the interview/reinterview responses *agreed* when there was an exact match between the two responses. For continuous variables, the two responses were considered to match when their values fell within one standard deviation unit of each other.¹⁰

The second measure evaluated temporal stability using one of three relational statistics: Cramer's V, Kendall's tau-*b* (τ_b), and the Pearson product-moment correlation coefficient (*r*). The selection of a relational statistic was dependent upon the properties of the particular variable. Cramer's V was used for items with discrete, unordered response categories (e.g., yes/no responses). Kendall's tau-*b* (τ_b), which takes into account tied rankings,¹¹ was used for questions answered using ordered categories (e.g., never, sometimes, often). For items yielding interval or ratio scale responses (e.g., income), the Pearson product-moment correlation coefficient (*r*) was used. In the reinterview instrument, information from the initial interview was preloaded in order to ensure that reinterview questions were asked in the same way and with the same wording across the two interviews. Lack of agreement (or low association) between responses from the same individuals reflects instability over short time periods due to measurement error. In contrast, high indices of agreement suggest that interview responses were relatively free of response errors that cause response instability over short periods of time.

While analyses were based on the 235 respondents who completed reinterviews, effective sample sizes are presented for each item because analyses were further restricted to cases with determinate responses to the relevant items in both interviews. Because not all items were applicable to all respondents (e.g., only B&B-eligible students were asked undergraduate experience items), variation exists in the number of cases on which the reliability indices were based. Results of the reliability analyses are presented in table 4-28.

Dependent children. In the interview and subsequent reinterview, sample members were asked, "Do you have any children that you support financially?" If yes, the follow-up question collected the numbers of these dependents in four different age ranges: less than 5 years old, 5–12, 13–16, and more than 16 years. The overall temporal stability for this series of items was quite high. Percent agreement was above 90 percent for all but one item. The relational statistic ranged from 0.81 to 0.97.

The item with the highest measure of reliability was the first one, which determined whether the respondents had any dependent children they supported financially. Percent agreement for this item was 98.7, with a relational statistic of 0.97. Most respondents reported "no" to this item, as evidenced by the reduction in the number of cases in the follow-up questions. While still within acceptable limits of reliability, respondent reports of the number of dependents over age 16 had the lowest measures of temporal stability, with 87.5 percent agreement and a relational statistic of 0.81.

¹⁰This is equivalent to within one-half standard deviation of the average (best estimate of actual value) of the two responses.

¹¹See for example, Kendall, M. (1945). "The treatment of ties in rank problems." *Biometrika*, Vol. 33, pp. 81–93; and Agresti, A. (1984). *Analysis of Ordinal Categorical Data*. New York, NY: Wiley & Sons.

Table 4-28. — Reliability indices for selected CATI items

Item series	Number of cases ¹	Percent agreement ²	Relational statistic
Dependent children			
Have any dependent children	235	98.7	0.97 ³
Number of dependents less than 5 years old	56	94.6	0.94 ⁴
Number of dependents 5–12 years	56	92.9	0.94 ⁴
Number of dependents 13–16 years	56	96.4	0.91 ⁴
Number of dependents more than 16 years old	56	87.5	0.81 ⁴
Source of child care	41	58.5	0.55 ³
Average monthly child care costs	#	#	#
Sources of financial aid			
Financial aid received: employer assistance	29	96.6	0.93 ³
Financial aid received: personal loan from bank	28	96.4	0.85 ³
Financial aid received: veteran's benefits	29	100.0	1.00 ³
Financial aid received: aid from private organization	29	89.7	0.79 ³
Financial aid received: foreign organization	#	#	#
Financial aid received: other source	29	79.3	0.15 ³
Support for educational expenses			
Did anyone, such as parents, pay tuition and fees	165	75.2	0.59 ^{5,7}
Did anyone provide money for school-related expenses, (excluding tuition)	164	78.0	0.48 ^{3,7}
How much was given for school-related expenses (excluding tuition)	28	82.1	0.60 ⁴
Income			
Earnings in 1999	200	99.5	0.93 ⁴
Earnings in 1998 same as 1999	92	75.0	0.50 ³
Earnings for 1998	27	100.0	0.99 ⁴
Spouse's earnings in 1999	50	98.0	0.98 ⁴
Spouse's earnings in 1998 same as 1999	27	74.1	0.37 ³
Spouse's earnings for 1998	#	#	#
Credit Cards			
Number of credit cards in own name	232	78.0	0.71 ⁵
Pay off each month or carry a balance	169	88.8	0.78 ³
Parents help pay credit card bills	47	87.2	0.53 ^{3,7}
Use credit card to pay tuition	170	90.0	0.69 ^{3,7}
Professional licenses			
Number of professional licenses	235	77.0	0.67 ⁴
Professional license	53	73.6	0.81 ^{5,6}
Technology usage			
Frequency of using e-mail to communicate	51	80.4	0.76 ⁵
Frequency of searching Internet for information/research	51	90.2	0.71 ⁵
Frequency of participating in chat rooms for class	51	82.4	0.57 ^{3,7}
Frequency of using spreadsheet software	50	68.0	0.60 ⁵
Frequency of programming computer languages	50	72.0	0.40 ⁵
Frequency of using word-processing software	51	86.3	0.35 ^{5,7}

#Too few cases to report

¹Analyses were conducted only for respondents with determinate responses on both the initial interview and the reinterview; not all questions were applicable to all respondents.

²Percentage agreement is based on an exact match for nominal and ordinal measures, and differences not exceeding one standard deviation unit for continuous measures.

³Relational statistic used was Cramer's V.

⁴Relational statistic used was the Pearson product moment correlation coefficient, r.

⁵Relational statistic used was Kendall's Tau, τ_b .

⁶Up to three professional license responses were allotted, but only the first one was included in the analysis.

⁷The relational statistic is deceptively deflated due to insufficient variation across valid response categories. As a result, minor changes on the distribution of responses between the original and reinterview significant lower of the correlation coefficient.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000).

Respondents with dependent children under 12 were asked to identify the individual or group (e.g., parents, other relatives, friends or neighbors, or child care center) that was the primary child care provider while the respondent was at the named institution. A follow-up

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question then asked about the average monthly day care costs during the last term in the 1999–2000 academic year. Overall, percent agreement was relatively poor on the primary item, perhaps indicative of the inherent variability in the child care available to postsecondary students; the followup item applied to too few reinterview respondents for appropriate estimation of reliability.

The distribution of responses between the initial interview and the reinterview suggests several problems with the wording of the question “*While you’re at school, who cares for your child/children?*” This question may have been especially difficult to answer for students with schedules that changed regularly. For example, students might call upon a friend or neighbor for evening classes, but place their child/children in a day care facility during the day. Child care arrangements could change from term to term as well. Additionally, the question was not designed to handle respondents who may have had a child in a child care facility and another child at school during the day. Furthermore, it may have been difficult to distinguish child care while at school from child care at any other time. To improve the response consistency of this item in future studies, it will help to specify a time period of interest, and allow multiple responses for those who may have children with differing arrangements.

Financial aid. This series of questions represents a new way of obtaining information about financial assistance received from sources other than federal student aid. Private commercial loans and employer reimbursement are among the new sources of aid increasingly being used by students financing their postsecondary education.

Overall results indicated remarkably high reliability for these items, with one exception. Percent agreement ranged from 79.3 to 100 percent and the relational statistic ranged from 0.15 to 1.00. Receipt of veteran’s benefits as a form of financial aid had 100 percent agreement and a relational statistic of 1.00, while employer assistance, personal loans from banks, and aid from private organizations all had at least 89.7 percent agreement and a relational statistic of at least 0.79. However, financial aid from other sources not previously mentioned had lower reliability, with 79 percent agreement and a relational statistic of 0.15.

This series of items was first introduced in the field test of NPSAS:2000.¹² Initial indicators of reliability for these items from the field test were quite good; however, indicators of reliability from the full-scale study were better. For example, percent agreement for receipt of private/commercial loans increased from 91.0 to 96.4 percent and employer aid increased from 92.3 to 96.6 percent. Likewise, relational statistics increased: private loans went from 0.74 to 0.85 and employer aid increased from 0.60 to 0.93.

Support for educational expenses. The items pertaining to parental support for postsecondary tuition and other expenses had moderately acceptable measures of temporal stability, with percent agreement ranging from 75 to 82 percent. The relational statistics were

¹² For results of the NPSAS:2000 field test, which tested procedures and instruments before the start of the full-scale study, see Biber, M.R., Link, M.W., Riccobono, J.A., & Siegel, P.H. (October 2000). *National Postsecondary Student Aid Study: 2000 Field Test Methodology Report* (NCES Working Paper No. 2000-17). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

low, ranging from 0.48 to 0.60. The first item asked if parents helped to pay tuition, and response options allowed sample members to report that parents paid none, some, or all of their tuition. The majority of the inconsistent responses were between the “some” and “all” categories.

The follow-up item regarding support for school-related expenses excluding tuition had 78 percent agreement and a relational statistic of 0.48. It is possible that the term “school-related expenses, not including tuition” was vague and thus respondents might have a difficult time determining what to include when answering the question.

The item that collected the amount received in support for school-related expenses excluding tuition likely suffered from the problem just mentioned. Although there was 82 percent agreement, the relational statistic was 0.60.

Income. Reinterview results for sample members’ self-reported incomes for 1998 and 1999 (the “current year” for NPSAS:2000) and comparable items for the sample members’ spouses are presented in table 4-28. The reason for the inclusion of income items in the reinterview is twofold. First, these income measures were critical items for NPSAS:2000, and were closely related to postsecondary education plans. Moreover, income questions are typically among the most unreliable measures in interviews, and considerable efforts were made to improve the quality of the data collected. Overall, percent agreement showed good response stability over time for these items.

Respondents were first asked for their income in calendar year 1999 and then asked if the amount earned in 1998 was about the same as in 1999. If the answer to the second question was “no” then 1998 income was collected. The two items that collected dollar amounts for income had exceptionally high reliability, with at least 99 percent agreement and a relational statistic of at least 0.93 for both calendar years 1998 and 1999. The item with the lowest reliability measures in this series was the one that asked if 1998 income was about the same as in 1999. Percent agreement for this item was only 75 percent and the relational statistic was only 0.50. In future studies, the question should be reworded so that “about the same” is more clearly defined.

The same pattern was evident in the measures of response stability for spouse’s income. Reports of spouse’s 1999 income were very reliable, with 98 percent agreement and a relational statistic of 0.98. The item about whether the spouse’s 1998 income was the same as in 1999 had only 74 percent agreement and a relational statistic of 0.37.

Credit cards. The first question in the credit card series asked how many cards the respondent had in his or her own name: none, one or two, or three or more. Follow-up questions asked those with at least one credit card whether they carried a balance, if their parents helped to pay the credit card bills, and whether the credit cards were used to pay tuition. The number of cards held by respondents appears to have been the least reliable item in the series. It had 78 percent agreement and a relational statistic of 0.71. Reliability improved, however, for the follow-up items. For the remaining three items, percent agreement ranged from 87 to 90 percent and the relational statistic ranged from 0.53 to 0.78. The relational statistics for the last two items in the series are low relative to their levels of percent agreement.

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Professional licenses. Based on analyses of professional licenses and credentials collected in other NCES-sponsored studies (e.g., the National Education Longitudinal Study NELS:88/2000), there was some concern about the consistency of responses for students reporting the possession of professional licenses and certificates.

The first question asked for the number of licenses held (up to four). If the respondent reported having any licenses, a follow-up item collected up to three types of license. Results showed 77 percent agreement and a relational statistic of 0.67 for having any licenses, suggesting moderately acceptable reliability. Most cases of non-agreement, however, were due to reports of greater numbers of licenses in the reinterview, which could be because of real change. The reliability measures for the type of license were similar, with 74 percent agreement and a relational statistic of 0.81. These items have been revised in subsequent NCES surveys (BPS:1996/2001 and B&B:2000/2001) so that they collect much more detail about licenses and certifications. Literal strings are captured so that the strings and codes may be evaluated for accuracy and consistency to improve the way this information is collected.

Technology usage for B&B-eligible students. The NPSAS:2000 interview included several new items intended to capture the increased use of technology among students. The response options to these questions were never, sometimes, and often. The percent agreement and relational statistics for the technology usage items were moderately acceptable, with percent agreement reliability from 68 to 90 percent and with relational statistics ranging from 0.35 to 0.76.

Frequency of searching the Internet for homework or research purposes had the highest reliability statistics of all items in the series, with 90 percent agreement and a 0.71 relational statistic. However, two items suffered from relatively poor reliability. Using spreadsheet software and computer programming languages had 68 and 72 percent agreement, respectively. The relational statistics for these items were 0.60 and 0.40, respectively.

During both the initial interview and the reinterview, most of the students reported using e-mail, the Internet, and word-processing software “often.” Most also reported that they “never” used chat rooms to discuss educational issues. The low relational statistics for these measures are largely attributable to the unbalanced distribution of responses (i.e., the few among those initially in the minority category who reversed responses by the time of the reinterview).