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2004 National Study of Postsecondary Faculty (NSOPF:04) Report on Faculty and Instructional Staff in Fall 2003

E.D. TAB

May 2005

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Foreword

This E.D. TAB provides descriptive information about faculty and instructional staff who were employed in U.S. 2- and 4-year degree-granting institutions in the fall of 2003. It is the first E.D. TAB to use data from the 2004 National Study of Postsecondary Faculty (NSOPF:04). The E.D. TAB describes the gender, race/ethnicity, tenure status, and income of all faculty and instructional staff, by employment status, institution type, and program area.

NSOPF:04 is the fourth cycle of data collections on postsecondary faculty conducted by the National Center for Education Statistics (NCES). Previous collections were conducted for 1987–88, 1992–93, and 1998–99. Readers should consult appendix B of this E.D. TAB for more technical information about NSOPF:04.

The estimates presented in this E.D. TAB were produced using the NCES Data Analysis System (DAS), a web-based table-generating application that provides the public with direct, free access to the NSOPF:04 data as well as other postsecondary datasets collected by NCES. The DAS produces the design-adjusted standard errors necessary for testing the statistical significance of differences in the estimates (all differences reported in the text are statistically significant at the .05 level). Public-access data files and descriptive reports for this and other postsecondary datasets collected by NCES are available at <http://nces.ed.gov/DAS>.

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We would like to acknowledge the support of many individuals in the production of NSOPF:04 and this E.D. TAB specifically. The 2004 National Study of Postsecondary Faculty (NSOPF:04) was conducted by RTI International and MPR Associates for the National Center for Education Statistics (NCES). At RTI International, Margaret Cahalan, who was succeeded by Patricia Green, served as project director for NSOPF:04. Also at RTI, Marjorie Hinsdale-Shouse managed data collection; Brian Kuhr oversaw institutional contacting and response; Lisa Carly-Baxter managed faculty telephone interviews; Ruth Heuer and Thomas R. Curtin conducted extensive work on instrumentation and preparation of data files; Donna Jewell managed data collection and processing procedures; and Kimberly Ault and Darryl Creel conducted sampling, weighting, and imputation analyses. We also appreciate the hard work of many others at RTI too numerous to mention.

At MPR, Stephanie Nevill and Joanna Wu, with assistance from Stephen Lew, were responsible for programming and documenting the derived variables. Vicky Dinger prepared and created the Data Analysis System files with support from Joanna Wu and John Vavricka. Patti Gildersleeve prepared the E.D. TAB for publication.

At NCES, Linda Zimble reviewed the work during every phase of the project and made numerous improvements at every level, with helpful input from Tracy Hunt-White of NCES and Dan Heffron of Pinkerton Computer Consultants. Also at NCES, James Griffith and Dennis Carroll conducted additional reviews, and Paula Knepper and Marilyn Seastrom, Chief Statistician, provided a comprehensive technical review of this E.D. TAB.

The final E.D. TAB was also reviewed by Duc-Le To, Institute of Education Sciences; Michael P. Cohen, U.S. Bureau of Transportation Statistics; Valerie Martin Conley, Ohio University; Jon Fuller, National Association of Independent Colleges and Universities; Robin Gurley, Education Statistics Services Institute; David Leslie, College of William and Mary; Alexander C. McCormick, The Carnegie Foundation for the Advancement of Teaching; James C. Palmer, Illinois State University; Richard C. Richardson, Jr., New York University; and Larry E. Suter, National Science Foundation. We appreciate their time and dedication to improving this E.D. TAB.

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Introduction

This is the first E.D. TAB based on the 2004 National Study of Postsecondary Faculty (NSOPF:04), which describes faculty and instructional staff in public and private not-for-profit postsecondary institutions offering an associate's or higher degree in fall 2003. The employment status, race/ethnicity, gender, tenure status, and compensation of faculty and instructional staff are presented by institution type¹ and program area.² This section introduces the NSOPF:04 data, with tables presented in the next section. A glossary of the variables is provided in appendix A, and information about NSOPF:04 data collection and processing is in appendix B.

The faculty³ component of the NSOPF:04 is the fourth data collection of postsecondary faculty and instructional staff at degree-granting institutions, following administrations of NSOPF in 1987–88, 1992–93, and 1998–99. NSOPF:04 is based on survey data collected from a nationally representative sample of about 35,000 faculty and instructional staff, using a web-based questionnaire that was either self-administered or conducted via telephone with a trained interviewer. Completed interviews were obtained from about 26,100 faculty and instructional staff, for a weighted response rate for the faculty component of 76 percent.⁴ The survey respondents represent an estimated 1.2 million faculty and instructional staff in the 50 states and the District of Columbia. The population of faculty and instructional staff included instructional faculty, staff with instructional responsibilities, and faculty with no instructional responsibilities. Tables in this E.D. TAB include all survey respondents; instructional faculty, faculty with no instructional responsibilities (e.g., researchers with faculty appointments), and staff with instructional responsibilities regardless of faculty status. All comparisons made in the text were tested using Student's *t* statistic, and all differences cited were statistically significant at the .05 level. For more information about the methodology of NSOPF:04, see appendix B.

¹ Type of institution is derived from the 2000 Carnegie Classification. See the glossary (appendix A) for more details.

² See the glossary (appendix A) for detailed descriptions of the teaching disciplines included in each program area.

³ The terms “faculty” and “faculty and instructional staff” are used interchangeably in this E.D. TAB. Teaching and research assistants are not included in NSOPF.

⁴ See the technical notes for more information on response rates and nonresponse bias analysis.

NSOPF:04 covers a wide range of topics pertaining to faculty and instructional staff. The faculty questionnaire focused on the fall 2003 term, and included items relating to the nature of employment, academic and professional background, instructional responsibilities and workload, scholarly activities, job satisfaction and opinions, compensation, and sociodemographic characteristics.

Selected Results

- Among faculty and instructional staff in all institution types, 56 percent were employed full time and 44 percent were employed part time in fall 2003 (table 1).
- About two-thirds (67 percent) of faculty employed in public associate's institutions reported working part time, compared with 22 to 55 percent of faculty at other types of institutions (table 1).
- The largest proportion of full-time faculty and instructional staff were White (80 percent), compared with Asian/Pacific Islander (9 percent), Black (5 percent), Hispanic (3 percent), and other racial/ethnic groups (2 percent; table 2).
- Full-time faculty and instructional staff in agriculture/home economics and fine arts were more likely to be White (88 percent) than faculty and instructional staff in business, education, engineering, health sciences, humanities, natural sciences, and social sciences (69–83 percent; table 2).
- Asian/Pacific Islander faculty represented a larger proportion of full-time (table 2) than part-time faculty (table 3). Nine percent of full-time faculty were Asian/Pacific Islander, compared with 4 percent of those employed part time.
- Full-time faculty and instructional staff were more likely to be male than female in fall 2003: 62 percent were male and 38 percent were female (table 4).
- Full-time faculty and instructional staff at public doctoral and private not-for-profit doctoral institutions were less likely to be female (32–33 percent) than those at public master's, private not-for-profit baccalaureate, and other institutions (41 percent each), private not-for-profit master's institutions (43 percent), and public associate's institutions (50 percent; table 4).
- Gender differences in program area were apparent among full-time faculty and instructional staff at 4-year institutions (table 4). Male-dominated fields included engineering (90 percent were male, 10 percent were female), the natural sciences (77 percent were male, 23 percent were female), and business (73 percent were male, 27 percent were female). Education was the only program area with a larger proportion of women than men (58 percent were female, 42 percent were male).
- Women represented a larger proportion of part-time (table 5) than full-time faculty (table 4). Forty-eight percent of part-time faculty and instructional staff were women, compared with 38 percent who worked full time.
- The largest proportion of faculty and instructional staff employed full time in all institutions held tenure in fall 2003 (48 percent). Another 24 percent were not on the tenure track compared with 21 percent who were on the tenure track and 8 percent who were employed in institutions that did not have a tenure system (table 6).

- The largest proportion of part-time faculty and instructional staff were not on the tenure track (86 percent) compared with 3 percent who were tenured, 2 percent who were on the tenure track, and 9 percent whose institutions had no tenure system (table 7).
- The average total income for the 2003 calendar year among full-time faculty and instructional staff was \$81,200. This includes an average of \$67,400 in basic salary from the institution, \$5,000 in other income from the institution, \$2,200 in outside consulting income, and \$6,600 in other outside income⁵ (table 8).
- Health sciences faculty and instructional staff employed full time in 4-year institutions earned an average income of \$116,600, the highest total income in 2003 compared with their peers in other program areas (table 8). In 2003, faculty and instructional staff in engineering earned \$100,800, those in business earned \$99,200, and those in other program areas earned between \$66,000 and \$86,000.
- Faculty and instructional staff employed part time had lower total incomes (table 9) than those who worked full time (table 8). However, outside income other than consulting income for faculty employed part time averaged \$37,500 compared with \$6,600 for those who were employed full time.

⁵ These estimates include all full-time faculty and instructional staff, regardless of whether they earned a particular type of income for the 2003 calendar year. About 50 percent of faculty earned income from the institution other than basic salary, 30 percent earned consulting income, and 52 percent earned income from outside the institution other than consulting income for the 2003 calendar year. Among those full-time faculty who earned a particular type of income in 2003, the average amount earned was \$10,000 for income from the institution other than basic salary, \$7,400 for consulting income, and \$12,600 for income from outside the institution other than consulting income. NSOPF:04 Data Analysis System. Not shown in tables.

Tables

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Table 1. Percentage distribution of all faculty and instructional staff, by employment status, institution type, and program area: Fall 2003

Institution type and program area	Employment status	
	Full time	Part time
All institutions ¹	56.3	43.7
Public doctoral ²	77.8	22.2
Private not-for-profit doctoral ²	68.7	31.4
Public master's	63.3	36.7
Private not-for-profit master's	45.1	54.9
Private not-for-profit baccalaureate	63.2	36.8
Public associate's	33.3	66.7
Other ³	49.3	50.8
All program areas in 4-year institutions	66.1	33.9
Agriculture/home economics	78.4	21.6
Business	54.0	46.0
Education	51.3	48.7
Engineering	78.2	21.8
Fine arts	53.0	47.0
Health sciences	69.7	30.3
Humanities	65.4	34.6
Natural sciences	76.5	23.5
Social sciences	70.3	29.7
All other fields	62.6	37.4

¹ All public and private not-for-profit Title IV degree-granting institutions in the 50 states and the District of Columbia.

² Doctoral includes research/doctoral institutions, and specialized medical schools and medical centers as classified by the 2000 Carnegie Classification.

³ Public baccalaureate, private not-for-profit associate's, and other specialized institutions, except medical schools and medical centers.

NOTE: All faculty and instructional staff includes all faculty (regardless of whether they had instructional responsibilities) and all other instructional staff. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Table 2. Percentage distribution of all full-time faculty and instructional staff, by race/ethnicity, institution type, and program area: Fall 2003

Institution type and program area	Race/ethnicity ¹				
	White	Black	Asian/Pacific Islander	Hispanic	Other
All institutions ²	80.3	5.5	8.7	3.5	2.1
Public doctoral ³	78.9	4.0	12.2	3.0	2.0
Private not-for-profit doctoral ³	78.2	4.6	12.3	3.3	1.6
Public master's	78.1	8.6	7.2	3.7	2.4
Private not-for-profit master's	85.6	4.7	5.5	2.4	1.9
Private not-for-profit baccalaureate	85.7	6.6	3.4	2.2	2.0
Public associate's	80.7	6.9	4.0	5.9	2.5
Other ⁴	86.7	4.5	5.5	1.8	1.6
All program areas in 4-year institutions	80.3	5.1	9.7	3.0	2.0
Agriculture/home economics	87.8	2.1	6.1	2.5	1.5
Business	76.9	4.3	13.9	1.9	3.1
Education	83.1	6.6	4.1	3.3	2.9
Engineering	69.3	4.9	21.7	2.4	1.8
Fine arts	87.5	6.2	2.9	2.2	1.2
Health sciences	78.4	4.6	11.7	3.0	2.3
Humanities	83.1	4.9	5.3	4.4	2.3
Natural sciences	77.1	3.4	15.7	2.6	1.3
Social sciences	81.5	7.4	5.1	4.0	2.0
All other fields	84.5	7.3	3.9	2.4	1.9

¹ Black includes African American, Asian/Pacific Islander includes Native Hawaiian, Hispanic includes Latino, and Other includes American Indian/Alaska Native and those who selected more than one race. Race categories exclude Hispanic origin unless specified.

² All public and private not-for-profit Title IV degree-granting institutions in the 50 states and the District of Columbia.

³ Doctoral includes research/doctoral institutions, and specialized medical schools and medical centers as classified by the 2000 Carnegie Classification.

⁴ Public baccalaureate, private not-for-profit associate's, and other specialized institutions, except medical schools and medical centers.

NOTE: All full-time faculty and instructional staff includes all faculty (regardless of whether they had instructional responsibilities) and all other instructional staff employed full time by their institutions. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Table 3. Percentage distribution of all part-time faculty and instructional staff, by race/ethnicity, institution type, and program area: Fall 2003

Institution type and program area	Race/ethnicity ¹				
	White	Black	Asian/Pacific Islander	Hispanic	Other
All institutions ²	85.2	5.5	3.6	3.5	2.2
Public doctoral ³	83.6	3.2	7.7	3.6	2.0
Private not-for-profit doctoral ³	87.7	3.6	5.2	2.4	1.1
Public master's	87.2	4.7	2.6	3.2	2.4
Private not-for-profit master's	90.0	3.5	1.9	2.6	2.0
Private not-for-profit baccalaureate	87.5	7.2	2.7	1.5	1.1
Public associate's	83.7	6.8	2.7	4.4	2.4
Other ⁴	83.8	6.8	4.0	2.3	3.1
All program areas in 4-year institutions	86.5	4.5	4.3	2.8	2.0
Agriculture/home economics	89.7	4.2	#	#	6.1
Business	89.3	5.0	2.7	1.3	1.7
Education	89.0	4.4	1.2	3.7	1.6
Engineering	80.8	1.8	13.2	1.3	2.9
Fine arts	89.2	2.9	2.2	2.5	3.2
Health sciences	85.0	3.0	9.0	2.0	1.0
Humanities	85.6	4.3	3.7	4.6	1.7
Natural sciences	84.3	3.4	8.4	2.1	1.7
Social sciences	85.1	6.0	3.0	2.8	3.3
All other fields	85.8	7.5	2.2	3.1	1.4

Rounds to zero.

¹ Black includes African American, Asian/Pacific Islander includes Native Hawaiian, Hispanic includes Latino, and Other includes American Indian/Alaska Native and those who selected more than one race. Race categories exclude Hispanic origin unless specified.

² All public and private not-for-profit Title IV degree-granting institutions in the 50 states and the District of Columbia.

³ Doctoral includes research/doctoral institutions, and specialized medical schools and medical centers as classified by the 2000 Carnegie Classification.

⁴ Public baccalaureate, private not-for-profit associate's, and other specialized institutions, except medical schools and medical centers.

NOTE: All part-time faculty and instructional staff includes all faculty (regardless of whether they had instructional responsibilities) and all other instructional staff employed part time by their institutions. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Table 4. Percentage distribution of all full-time faculty and instructional staff, by gender, institution type, and program area: Fall 2003

Institution type and program area	Gender	
	Male	Female
All institutions ¹	61.7	38.3
Public doctoral ²	67.4	32.7
Private not-for-profit doctoral ²	68.4	31.6
Public master's	59.0	41.0
Private not-for-profit master's	57.3	42.7
Private not-for-profit baccalaureate	59.1	40.9
Public associate's	50.4	49.6
Other ³	58.7	41.3
All program areas in 4-year institutions	64.1	35.9
Agriculture/home economics	63.9	36.1
Business	72.6	27.4
Education	41.7	58.3
Engineering	90.5	9.5
Fine arts	62.6	37.4
Health sciences	52.0	48.0
Humanities	59.0	41.0
Natural sciences	77.1	22.9
Social sciences	64.3	35.7
All other fields	58.7	41.3

¹ All public and private not-for-profit Title IV degree-granting institutions in the 50 states and the District of Columbia.

² Doctoral includes research/doctoral institutions, and specialized medical schools and medical centers as classified by the 2000 Carnegie Classification.

³ Public baccalaureate, private not-for-profit associate's, and other specialized institutions, except medical schools and medical centers.

NOTE: All full-time faculty and instructional staff includes all faculty (regardless of whether they had instructional responsibilities) and all other instructional staff employed full time by their institutions. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Table 5. Percentage distribution of all part-time faculty and instructional staff, by gender, institution type, and program area: Fall 2003

Institution type and program area	Gender	
	Male	Female
All institutions ¹	52.1	48.0
Public doctoral ²	50.2	49.8
Private not-for-profit doctoral ²	58.7	41.3
Public master's	50.1	49.9
Private not-for-profit master's	53.5	46.5
Private not-for-profit baccalaureate	50.6	49.4
Public associate's	50.9	49.2
Other ³	56.8	43.2
All program areas in 4-year institutions	52.9	47.1
Agriculture/home economics	35.6	64.4
Business	74.4	25.6
Education	34.2	65.8
Engineering	89.8	10.2
Fine arts	52.4	47.6
Health sciences	41.2	58.8
Humanities	43.9	56.1
Natural sciences	60.3	39.7
Social sciences	60.2	39.8
All other fields	57.8	42.2

¹ All public and private not-for-profit Title IV degree-granting institutions in the 50 states and the District of Columbia.

² Doctoral includes research/doctoral institutions, and specialized medical schools and medical centers as classified by the 2000 Carnegie Classification.

³ Public baccalaureate, private not-for-profit associate's, and other specialized institutions, except medical schools and medical centers.

NOTE: All part-time faculty and instructional staff includes all faculty (regardless of whether they had instructional responsibilities) and all other instructional staff employed part time by their institutions. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Table 6. Percentage distribution of all full-time faculty and instructional staff, by tenure status, institution type, and program area: Fall 2003

Institution type and program area	Tenure status			No tenure system at institution
	Tenured	On tenure track	Not on tenure track	
All institutions ¹	47.5	20.6	23.7	8.3
Public doctoral ²	49.3	19.4	30.3	0.9
Private not-for-profit doctoral ²	43.4	19.3	32.7	4.7
Public master's	53.9	27.6	17.6	0.9
Private not-for-profit master's	42.0	27.4	22.2	8.3
Private not-for-profit baccalaureate	42.7	24.4	22.7	10.2
Public associate's	48.5	15.5	10.1	25.9
Other ³	39.8	16.8	19.4	24.1
All program areas in 4-year institutions	47.4	21.7	26.5	4.5
Agriculture/home economics	55.1	19.6	22.5	2.8
Business	52.2	26.1	17.3	4.3
Education	36.1	24.7	32.6	6.6
Engineering	59.1	22.7	15.4	2.8
Fine arts	46.0	24.6	17.9	11.6
Health sciences	29.7	19.4	44.1	6.8
Humanities	52.5	22.5	22.2	2.9
Natural sciences	53.5	19.9	24.0	2.6
Social sciences	56.6	24.1	16.2	3.1
All other fields	44.6	20.7	30.7	4.0

¹ All public and private not-for-profit Title IV degree-granting institutions in the 50 states and the District of Columbia.

² Doctoral includes research/doctoral institutions, and specialized medical schools and medical centers as classified by the 2000 Carnegie Classification.

³ Public baccalaureate, private not-for-profit associate's, and other specialized institutions, except medical schools and medical centers.

NOTE: All full-time faculty and instructional staff includes all faculty (regardless of whether they had instructional responsibilities) and all other instructional staff employed full time by their institutions. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Table 7. Percentage distribution of all part-time faculty and instructional staff, by tenure status, institution type, and program area: Fall 2003

Institution type and program area	Tenure status			No tenure system at institution
	Tenured	On tenure track	Not on tenure track	
All institutions ¹	3.0	1.5	86.1	9.4
Public doctoral ²	5.6	1.9	91.5	1.0
Private not-for-profit doctoral ²	2.7	1.1	91.7	4.5
Public master's	4.3	1.0	91.9	2.8
Private not-for-profit master's	0.9	1.3	92.4	5.5
Private not-for-profit baccalaureate	3.3	1.5	86.4	8.8
Public associate's	2.6	1.8	82.7	12.9
Other ³	2.2	0.6	74.2	23.0
All program areas in 4-year institutions	3.3	1.3	88.9	6.5
Agriculture/home economics	3.1	3.2	93.3	0.4
Business	1.2	0.3	84.6	13.9
Education	2.4	1.5	91.2	4.9
Engineering	8.0	#	92.0	#
Fine arts	1.2	1.1	89.4	8.2
Health sciences	4.0	3.2	82.6	10.2
Humanities	5.1	0.8	90.6	3.6
Natural sciences	5.4	1.2	88.5	4.9
Social sciences	3.2	1.7	89.3	5.8
All other fields	2.1	0.5	92.8	4.7

Rounds to zero.

¹ All public and private not-for-profit Title IV degree-granting institutions in the 50 states and the District of Columbia.

² Doctoral includes research/doctoral institutions, and specialized medical schools and medical centers as classified by the 2000 Carnegie Classification.

³ Public baccalaureate, private not-for-profit associate's, and other specialized institutions, except medical schools and medical centers.

NOTE: All part-time faculty and instructional staff includes all faculty (regardless of whether they had instructional responsibilities) and all other instructional staff employed part time by their institutions. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Table 8. Average income of all full-time faculty and instructional staff, by source of income, institution type, and program area: 2003

Institution type and program area	Total earned income	Source of income			
		Basic salary from institution	Other income from institution	Outside consulting income	Other outside income ¹
All institutions ²	\$81,200	\$67,400	\$5,000	\$2,200	\$6,600
Public doctoral ³	91,100	76,300	5,700	2,600	6,400
Private not-for-profit doctoral ³	107,600	87,500	6,500	3,700	9,800
Public master's	69,200	58,300	4,200	1,500	5,300
Private not-for-profit master's	71,200	57,700	4,000	2,100	7,400
Private not-for-profit baccalaureate	64,400	54,700	2,700	1,200	5,700
Public associate's	63,900	52,600	4,900	1,100	5,200
Other ⁴	66,700	55,100	3,000	2,100	6,500
All program areas in 4-year institutions	84,800	70,500	5,000	2,400	6,800
Agriculture/home economics	75,800	66,300	2,600	1,900	5,000
Business	99,200	78,700	8,000	3,900	8,700
Education	71,100	58,000	4,700	1,800	6,700
Engineering	100,800	80,100	8,300	4,900	7,400
Fine arts	66,000	53,400	2,800	2,900	6,800
Health sciences	116,600	96,900	5,800	2,900	10,900
Humanities	66,700	57,700	3,100	1,100	4,800
Natural sciences	86,000	73,300	5,300	1,900	5,500
Social sciences	82,300	67,400	5,700	2,500	6,600
All other fields	74,700	61,200	4,300	2,600	6,600

¹Includes income from employment at another academic institution, income from any other employment (except consulting), and income from other sources (e.g., investment income, royalties/commissions, pensions, real estate, loans, alimony, or child support).

²All public and private not-for-profit Title IV degree-granting institutions in the 50 states and the District of Columbia.

³Doctoral includes research/doctoral institutions, and specialized medical schools and medical centers as classified by the 2000 Carnegie Classification.

⁴Public baccalaureate, private not-for-profit associate's, and other specialized institutions, except medical schools and medical centers.

NOTE: All full-time faculty and instructional staff includes all faculty (regardless of whether they had instructional responsibilities) and all other instructional staff employed full time by their institutions. All faculty and instructional staff are included in averages, regardless of whether they had that type of income. Income is for the 2003 calendar year for faculty and instructional staff employed in the Fall of 2003. Income excludes all reported nonmonetary income. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Table 9. Average income of all part-time faculty and instructional staff, by source of income, institution type, and program area: 2003

Institution type and program area	Total earned income	Source of income			
		Basic salary from institution	Other income from institution	Outside consulting income	Other outside income ¹
All institutions ²	\$52,500	\$11,200	\$900	\$2,900	\$37,500
Public doctoral ³	65,000	18,900	1,500	3,500	41,100
Private not-for-profit doctoral ³	74,100	16,300	1,100	5,100	51,600
Public master's	47,100	10,400	800	2,200	33,700
Private not-for-profit master's	58,300	9,300	700	3,900	44,400
Private not-for-profit baccalaureate	53,200	10,300	800	3,200	38,900
Public associate's	43,800	9,000	700	2,200	31,900
Other ⁴	58,200	9,200	1,200	3,300	44,400
All program areas in 4-year institutions	59,600	13,000	1,100	3,500	42,000
Agriculture/home economics	45,700	11,900	1,200	2,600	30,000
Business	81,500	10,300	1,000	5,200	65,000
Education	58,300	10,400	1,100	2,100	44,800
Engineering	70,000	15,900	1,600	4,200	48,400
Fine arts	43,300	9,900	900	5,500	26,900
Health sciences	80,600	24,600	1,500	4,200	50,300
Humanities	38,200	11,400	1,000	1,300	24,500
Natural sciences	54,900	14,300	1,200	2,900	36,400
Social sciences	57,700	12,000	1,200	3,700	40,800
All other fields	65,900	9,800	600	4,100	51,300

¹Includes income from employment at another academic institution, income from any other employment (except consulting), and income from other sources (e.g., investment income, royalties/commissions, pensions, real estate, loans, alimony, or child support).

²All public and private not-for-profit Title IV degree-granting institutions in the 50 states and the District of Columbia.

³Doctoral includes research/doctoral institutions, and specialized medical schools and medical centers as classified by the 2000 Carnegie Classification.

⁴Public baccalaureate, private not-for-profit associate's, and other specialized institutions, except medical schools and medical centers.

NOTE: All part-time faculty and instructional staff includes all faculty (regardless of whether they had instructional responsibilities) and all other instructional staff employed part time by their institutions. All faculty and instructional staff are included in averages, regardless of whether they had that type of income. Income is for the 2003 calendar year for faculty and instructional staff employed in the Fall of 2003. Income excludes all reported nonmonetary income. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

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Appendix A—Glossary

This glossary includes descriptions of the variables that were used in the tables of this E.D. TAB. The 2004 National Study of Postsecondary Faculty (NSOPF:04) Data Analysis System (DAS) was used to generate the tables. Readers may refer to appendix B for more information on the DAS application.

Variables are listed in the glossary index below by general topic area and in the order in which they appear in the tables. The glossary that follows is organized alphabetically by variable name (displayed in capital letters to the right of the variable label).

GLOSSARY INDEX

FACULTY AND INSTITUTION CHARACTERISTICS

Institution type	X121Q0
Institutional level	X102Q0
Program area	X02Q16
Employment status.....	Q5
Tenure status	Q12

DEMOGRAPHIC CHARACTERISTICS

Race/ethnicity	X06Q74
Gender.....	Q71

COMPENSATION

Total earned income.....	Q66SUM
Basic salary from institution	Q66A
Other income from institution.....	Q66B
Outside consulting income.....	Q66D
Other outside income	X06Q66

Tenure status**Q12**

Respondents were asked, “During the 2003 Fall Term at [institution name], were you...”

- Tenured
- On tenure track
- Not on tenure track
- No tenure system at institution

Employment status**Q5**

Respondents were asked, “During the 2003 Fall Term, did [institution name] consider you to be employed full time or part time?”

- Full time
- Part time

Basic salary from institution**Q66A**

Respondents were asked, “For the 2003 calendar year, please estimate your gross compensation before taxes. Do not include non-monetary compensation. (Enter dollar amount. If not sure, give your best estimates. If not applicable, enter 0.) First, your compensation from [institution name]: What is your basic salary during the calendar year from this institution?”

Other income from institution**Q66B**

Respondents were asked, “For the 2003 calendar year, please estimate your gross compensation before taxes. Do not include non-monetary compensation. (Enter dollar amount. If not sure, give your best estimates. If not applicable, enter 0.) Next, your compensation from other sources: How much compensation did you receive from other income from this institution not included in basic salary (e.g., for summer session, overload courses, administration, research, coaching sports, etc.)?”

Outside consulting income**Q66D**

Respondents were asked, “For the 2003 calendar year, please estimate your gross compensation before taxes. Do not include non-monetary compensation. (Enter dollar amount. If not sure, give your best estimates. If not applicable, enter 0.) Next, your compensation from other sources: How much were you paid for outside consulting or freelance work?”

Total earned income**Q66SUM**

This derived variable represents the total earned income for the 2003 calendar year as reported by the respondent. It is calculated based on the reported income in basic salary from the institution, other income from the institution, income from another academic institution, income from consulting or freelance work, income from other employment, or income from other sources (e.g., investment income, royalties/commissions, pensions, real estate, loans, alimony, or child support).

Gender**Q71**

Self-reported gender of respondent.

Male
Female**Program area****X02Q16**

Respondents were asked, “What is your principal field or discipline of teaching at [institution name]?” Respondents were then asked to select a general area and a specific discipline from a list of codes produced based on their answer. This derived variable condenses the list of 32 general areas into 10 program areas.

Agriculture and home economics	Agriculture/natural resources/related Family/consumer sciences, human sciences
Business	Business/management/marketing/related
Education	Education
Engineering	Engineering technologies/technicians
Fine arts	Arts--visual and performing
Health sciences	Health professions/clinical sciences
Humanities	English language and literature/letters Foreign languages/literature/linguistics History Philosophy and religion
Natural sciences	Biological and biomedical sciences Physical sciences Mathematics and statistics Computer/info sciences/support tech
Social sciences	Psychology Area/ethnic/cultural/gender studies Social sciences (except psychology and history)
All other programs	No principal teaching field Architecture and related services Communication/journalism/communication tech Construction trades Legal professions and studies Library science Mechanical/repair technologies/techs Multi/interdisciplinary studies Parks/recreation/leisure/fitness studies Precision production Personal and culinary services Public administration/social services Science technologies/technicians Security & protective services Theology Transportation & materials moving

Other outside income**X06Q66**

This derived variable was created to report a respondent's income from sources (other than outside consulting) outside their sampled institution for the 2003 calendar year. Includes income from employment at another academic institution, income from any other employment (except consulting), and income from other sources (e.g., investment income, royalties/commissions, pensions, real estate, loans, alimony, or child support).

Race/ethnicity**X06Q74**

Respondent's self-reported race/ethnicity. Respondents were asked to pick one or more race categories to identify themselves. The categories were American Indian or Alaska Native; Asian; Black or African American; Native Hawaiian or Other Pacific Islander; and White. A separate item asked about Hispanic or Latino ethnicity. Those who identified themselves as Hispanic or Latino are categorized as Hispanic regardless of race.

White	White, not Hispanic or Latino
Black	Black or African American, not Hispanic or Latino
Asian/Pacific Islander	Asian; Native Hawaiian or other Pacific Islander, not Hispanic or Latino
Hispanic	Hispanic or Latino (regardless of race)
Other	American Indian or Alaska Native or More than one race, not Hispanic or Latino

Institutional level**X102Q0**

This derived variable was created from the 2000 Institutional Characteristics IPEDS data to indicate the level of degree granted by the institution (4-year or 2-year) for the institutions sampled for NSOPF:04. (Some institutions may have changed level by fall 2003.) This variable was used to restrict the cases in the program area rows to those who were employed in 4-year institutions.

Institution type**X121Q0**

This derived variable identifies the type of institution in which the respondent was employed. It was derived using the 2000 Carnegie Classification combined with the control (public or private not-for-profit) of the institution. The Carnegie code is listed in parentheses after each description. For more information about the Carnegie Classification system adopted in 2000, see The Carnegie Foundation for the Advancement of Teaching (2001).

Public doctoral	Includes public institutions in the following categories: Doctoral/Research Universities—Extensive (15) Doctoral/Research Universities—Intensive (16) Medical schools and medical centers (52)
Private not-for-profit doctoral	Includes private not-for-profit institutions in the following categories: Doctoral/Research Universities—Extensive (15) Doctoral/Research Universities—Intensive (16) Medical schools and medical centers (52)
Public master's	Includes public institutions in the following categories: Master's Colleges and Universities I (21) Master's Colleges and Universities II (22)
Private not-for-profit master's	Includes private not-for-profit institutions in the following categories:

*Institution type (continued)***X121Q0**

	Master's Colleges and Universities I (21) Master's Colleges and Universities II (22)
Private not-for-profit baccalaureate	Includes private not-for-profit institutions in the following categories: Baccalaureate Colleges—Liberal Arts (31) Baccalaureate Colleges—General (32) Baccalaureate/Associate's Colleges (33)
Public associate's	Includes public institutions in the following category: Associate's Colleges (40)
Other	Includes institutions in the following categories: Public baccalaureate (31, 32, and 33) Private not-for-profit associate's (40) Theological seminaries and other specialized faith-related institutions (51) Other separate health profession schools (53) Schools of engineering and technology (54) Schools of business and management (55) Schools of art, music, and design (56) Schools of law (57) Teachers colleges (58) Other specialized institutions (59) Tribal colleges (60)

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Appendix B—Technical Notes and Methodology

Overview

The 2004 National Study of Postsecondary Faculty (NSOPF:04) is the fourth cycle of data collections on postsecondary faculty conducted by the U.S. Department of Education’s National Center for Education Statistics (NCES). NSOPF:04 was designed to provide a national profile of faculty and instructional staff: their professional backgrounds, responsibilities, workloads, salaries, benefits, and attitudes. Previous cycles were conducted in 1987–88, 1992–93, and 1998–99. Additional information on the first three cycles of NSOPF is available at the NSOPF web page (<http://nces.ed.gov/surveys/nsopf/>). The forthcoming NSOPF:04 Methodology Report will provide detailed information on NSOPF:04.

Sample Design

The 2004 National Study of Postsecondary Faculty (NSOPF:04) consisted of a sample of about 35,000 faculty and instructional staff across a sample of 1,080 institutions in the 50 States and the District of Columbia. This section provides details regarding the composition and construction of the institution and faculty sampling frames, methods used for selection of the institution and faculty samples, and post-survey data enhancement procedures, including nonresponse bias analysis, imputation, and weighting.

Sampling Frame

This administration of NSOPF:04 has employed a two-stage sampling methodology for selection of eligible faculty and instructional staff. The first sampling stage comprised all eligible institutions, while the second sampling stage included all faculty and instructional staff from the sampled institutions.

Institution Sample

The institutions eligible for NSOPF:04 included institutions in the traditional sector of postsecondary education, that is, degree-granting Title IV participating institutions that provide formal instructional programs of at least two years’ duration, that are public or private not-for-

profit, and that are designed primarily for students who have completed the requirements for a high school diploma or its equivalent. NSOPF:04 does not include private for-profit or less-than-2-year institutions.

The institution universe for NSOPF:04 was taken from the 2000–01 Integrated Postsecondary Education Data System (IPEDS) Institutional Characteristics (IPEDS-IC) file. In order to allow precise survey estimates for institutional sectors of interest, this universe of institutions was stratified based on institution type and level of degree offered. Institution type distinguished between public and private not-for-profit, while level of degree offered used the 2000 Carnegie Classification system. Table B-1 summarizes the number of eligible institutions for each of the resulting 10 primary institutional strata, based on the IPEDS-IC file.

Table B-1. Distribution of NSOPF:04 institution universe and sample, by control and Carnegie Classification

Carnegie Classification	Total		Public		Private not-for-profit	
	Universe	Sample	Universe	Sample	Universe	Sample
Total	3,380	1,080	1,700	680	1,680	400
Doctoral	300	300	190	190	110	110
Master's	590	200	270	120	320	80
Baccalaureate	570	160	90	30	480	130
Associate's	1,180	350	1,030	340	150	10
Other/Unknown ¹	730	70	110	10	620	60

¹There were 44 sample institutions that had an unknown Carnegie code at the time of sample selection that were subsequently reassigned to their appropriate strata. Therefore, there are no longer any institutions with unknown Carnegie codes in the sample, but some still remain in the universe.

NOTE: The universe and sample counts reflect institutions that were added after the main sample was selected to account for institutions that became eligible for NSOPF:04 since construction of the institution sampling frame from the Winter:02 IPEDS. Universe and sample numbers are rounded to the nearest 10. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Faculty and Instructional Staff Sample

The second stage of the sample selection for NSOPF:04 included faculty and instructional staff in the postsecondary institutions selected at the first stage. “Faculty” refers to employees with faculty status, who may or may not have instructional responsibilities. Instructional staff, also included, are those with instructional responsibilities regardless of faculty status. Instructional responsibilities included teaching classes either for credit or not for credit, providing individual instruction, serving on thesis or dissertation committees, advising or

otherwise supervising first-professional, graduate, or undergraduate students. In addition, eligible individuals surveyed by the 2003–04 NSOPF included all faculty and instructional staff

- Who were permanent, temporary, adjunct, visiting, acting, or postdoctoral appointees;
- Who were employed full or part time by the institution;
- Who were tenured, nontenured but on the tenure track, or nontenured and not on the tenure track;
- Who were in professional schools (e.g., medical, law, dentistry, etc.); or
- Who were on paid sabbatical leave.

Under the above eligibility criteria, the list of **ineligible individuals** for NSOPF:04 included staff

- Who were graduate or undergraduate teaching or research assistants;
- Who had instructional duties outside the United States, unless they were on sabbatical leave;
- Who were on leave without pay;
- Who were not paid by the institution, such as those in the military or part of a religious order; or
- Who were supplied by independent contractors or who volunteer their services.

The institution sample selection was based on a probability proportional to size (PPS) selection methodology, where each institution was assigned a composite measure of size (MOS) that reflected the number of eligible faculty and instructional staff in each of the following six faculty strata.

- Hispanic
- Non-Hispanic Black
- Asian and Pacific Islander
- Full-time female
- Full-time male
- All other

Faculty counts needed for MOS calculations were obtained from the Fall Staff Survey Component of the Winter 2001–02 IPEDS Data Collection (Winter:02 IPEDS). Sampling frames for selection of faculty and instructional staff were constructed institution-by-institution. Each sampled institution was asked to provide a complete listing of their faculty and instructional staff eligible for NSOPF:04. While most such lists were delivered electronically, a number of lists

were provided on hardcopies, or had to be constructed using online sources and institution directories.

Institution Selection

The institution sampling frame for NSOPF:04 was constructed from the IPEDS-IC files. The institutions on the sampling frame were partitioned into 10 institutional strata based on institutional control, highest level of offering, and Carnegie Classification. Ultimately, a sample of 1,080 institutions¹ was selected using PPS based on the number of faculty and students at each institution, using Chromy's sampling algorithm (1979). Sample sizes and their corresponding sampling rates were established using a customized cost/variance optimization procedure, which aimed to identify the allocation that would accommodate all analytical objectives of this survey while minimizing data collection costs. Table B-1 summarizes the distribution of the resulting sample of institutions for NSOPF:04. The selected institutions were contacted and asked to provide lists of eligible faculty and instructional staff for their institutions. Table B-2 shows the distribution of sampled and eligible institutions² by institutional characteristics, as well as their corresponding unweighted and weighted response rates.

Faculty Sample Selection

The sample of faculty was selected using an equal probability stratified systematic sampling, within cells indexed by institutional and faculty strata. A customized cost/variance optimization program was used to determine the desired allocation of respondents to institution-by-person strata, which aimed to secure at least the same level of precision for key estimates as those achieved during the previous administration of the survey. Table B-3 shows the distribution of the sampled and eligible faculty members by institutional characteristics, as well as their corresponding unweighted and weighted response rates.

Perturbation

To protect the confidentiality of NCES data that contain information about specific individuals, NSOPF:04 data were subject to perturbation procedures to minimize disclosure risk. Perturbation procedures, which have been approved by the NCES Disclosure Review Board, preserve the central tendency estimates, but may result in slight increases in non-sampling errors.

¹ In order to account for the institutions that became eligible for NSOPF:04 after construction of the institution sampling frame from the Winter:02 IPEDS, some institutions were added to the sample. Moreover, the 44 sample institutions that had an unknown Carnegie code at the time of sample selection were reassigned to their appropriate strata. Therefore, there are no longer any institutions with unknown Carnegie codes in the sample, but some still remain in the universe.

² Some institutions either merged or closed after sample selection, and therefore were ineligible for NSOPF:04.

Table B-2. Counts of sampled, eligible, and participating NSOPF:04 institutions with response rates, by institution type

Institution type	Institution count			Response rate (percent) ¹	
	Sampled	Eligible ²	Participating	Unweighted	Weighted
All institutions	1,080	1,070	980	91.3	90.6
Public					
Doctoral	190	190	180	92.7	93.2
Master's	120	120	100	89.7	89.1
Baccalaureate	30	30	30	92.9	88.4
Associate's	340	330	290	89.1	87.4
Other	10	10	10	100.0	100.0
Private not-for-profit					
Doctoral	110	110	100	92.0	95.6
Master's	80	80	80	92.6	86.8
Baccalaureate	130	130	120	94.6	93.1
Associate's	10	10	10	75.0	86.0
Other	60	60	60	93.3	91.8

¹Based on original unrounded numbers.

²Some institutions either merged or closed after sample selection, and therefore were ineligible for NSOPF:04.

NOTE: Sampled, eligible, and participating institution counts are rounded to the nearest 10. Details may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Imputation

All variables with missing data used in this E.D. TAB, as well as those included in the related Data Analysis System (DAS) release, have been imputed. Item imputation for NSOPF:04 was performed in several steps. In the first step, using a cold-deck imputation method, missing values of gender, race, and ethnicity were filled based on the sampling frame information or institutional record data. These three key demographic variables were imputed prior to any other variables, since they were used as key predictors for all other variables on the data file.

After all logical and cold-deck imputation procedures were performed, the remaining variables were imputed using a weighted sequential hot-deck method. Initially, variables were separated into two groups: conditional and unconditional variables. The first group (unconditional) consisted of variables that apply to all respondents, while the second group (conditional) consisted of variables that apply to only a subset of the respondents. That is, conditional variables were subject to gate questions. Such variables were then categorized with

Table B-3. Counts of sampled, eligible, and responding NSOPF:04 faculty with response rates, by institution type

Institution type	Faculty count			Response rate (percent) ¹	
	Sampled	Eligible ²	Responding ²	Unweighted	Weighted
All faculty	35,629	34,330	26,110	76.1	75.6
Institutional level					
2-year	9,188	8,830	6,440	73.0	73.7
4-year non-doctoral	8,747	8,430	6,720	79.7	78.6
4-year doctoral	17,694	17,070	12,950	75.8	75.0
Institutional control					
Public	23,280	22,450	17,120	76.2	76.0
Private not-for-profit	12,349	11,880	8,990	75.7	74.7
Institutional sector					
Public					
Doctoral	9,827	9,500	7,460	78.6	78.1
Master's	3,485	3,350	2,620	78.1	78.5
Baccalaureate	693	680	510	75.4	67.4
Associate's	9,129	8,770	6,420	73.1	73.7
Other	146	140	110	73.7	73.3
Private not-for-profit					
Doctoral	4,652	4,470	3,160	70.8	68.2
Master's	3,020	2,890	2,270	78.6	78.5
Baccalaureate	3,218	3,120	2,520	80.8	78.7
Associate's	242	240	190	79.8	91.0
Other	1,217	1,160	850	73.1	70.6

¹Based on original unrounded numbers.

²Numbers rounded to the nearest 10.

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

respect to the complexity of their conditionality. Next, missing values of all variables were imputed in the order from the lowest to the highest percentage missing and level of conditionality.

All variables that had less than 1 percent missing were imputed using imputation classes defined by a combination of gender, race, and ethnicity and were sorted by institution type, institution size, and the faculty sampling stratum. The imputation classes for the remaining unconditional variables (that had more than 1 percent missing) were determined using Chi-Square Automatic Interaction Detector (CHAID) to identify the matching criteria closely related to the variable being imputed (Kass 1980). For this purpose, key demographic variables that

were logically imputed and all imputed variables with less than 1 percent missing were used as predictors. Overall, 146 variables from the faculty questionnaire were imputed, including 27 variables with less than 1 percent of the cases imputed, 11 variables with 1 to 5 percent imputed, 94 variables with 5 to 10 percent imputed, and 14 variables with more than 10 percent of the cases imputed.

Weighting

All estimates in this E.D. TAB are weighted to represent the target population described in the sample design section. The weights compensate for the unequal probability of selection of institutions and faculty members in the NSOPF sample. The weights also adjust for frame multiplicity at the institution and faculty levels,⁶ unknown faculty eligibility, nonresponse, and poststratification. In order to compute the final faculty analysis weight, STUDYWT, first an institution-level component weight was computed to reflect the selection process for the institution from which a faculty was sampled. Next, the resulting component weights were used to calculate the faculty weights. All weight components, including those reflecting selection probabilities and adjustment factors, are summarized in table B-4.

Quality of Estimates

Survey weights are computed with the goal of removing any bias that might result due to differential nonresponse and undercoverage. In order to measure the efficacy of bias-reducing adjustments, a series of analyses were conducted at the item and record levels. In the subsequent sections, highlights of these analyses are summarized.

Unit Response Rates and Bias Analysis

Unit and item response rates for NSOPF:04 were reviewed. Those with a response rate below 85 percent were evaluated for the potential magnitude of nonresponse bias. NSOPF:04 has two stages of data collection: institution and faculty. As seen in table B-2, the overall and stratum level institution weighted response rates exceeded 85 percent; hence, no nonresponse bias analysis was conducted at the institution level. However, at the faculty and item levels, the weighted response rates within certain strata were less than 85 percent. Consequently,

⁶ It was determined after institution sample selection that in some cases, either an institution had merged with another institution, or faculty lists for two or more campuses were submitted as one combined faculty list. In these instances, the institution weights were adjusted for the joint probability of selection. Likewise, faculty members who taught at more than one institution during the NSOPF year also had multiple chances of selection. If it was determined that a faculty member had taught at more than one institution, the faculty's weight was adjusted to account for multiple chances of selection.

nonresponse bias analyses were conducted at the faculty and item levels when the corresponding weighted response rates were below 85 percent at the national or stratum levels.

Table B-4. Summary of weight components for NSOPF:04

Weight component	Purpose
Institution sampling weight	Account for the institution’s probability of selection.
Institution multiplicity adjustment	Adjust the weights for institutions that had multiple chances of selection.
Institution poststratification adjustment	Adjust the institution weights to match published totals to ensure population coverage.
Faculty sampling weight	Account for the faculty’s probability of selection.
Faculty multiplicity adjustment	Adjust the weights for faculty members who taught at more than one institution.
Faculty unknown eligibility adjustment	Adjust the weights for nonresponding faculty members with unknown eligibility.
Faculty nonresponse adjustment	Adjust the weights to compensate for nonresponding faculty members.
Faculty poststratification adjustment	Adjust the faculty weights to match known published totals to ensure population coverage.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

The bias in an estimated mean based on respondents, \bar{y}_R , is the difference between this estimate and the target parameter, μ , which is the mean that would result if a complete census of the target population was conducted and all units responded. This bias can be expressed as follows:

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

However, for variables that are available from the frame, μ can be estimated by $\hat{\mu}$ without sampling error, in which case the bias in \bar{y}_R can then be estimated by:

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

Moreover, an estimate of the population mean based on respondents and nonrespondents can be obtained by:

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

where $\hat{\eta}$ is the weighted unit nonresponse rate, based on weights prior to nonresponse adjustment. Consequently, the bias in \bar{y}_R can then be estimated by:

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

That is, the estimate of the nonresponse bias is the difference between the mean for respondents and nonrespondents multiplied by the weighted nonresponse rate, using the faculty-level design weight prior to nonresponse adjustment.

Faculty-Level Nonresponse Bias Analysis

A faculty respondent is defined as any sample member who is determined to be eligible for the study and has valid data for the selected set of key analytical variables. As shown in table B-3, for the approximately 34,330 eligible sample faculty members the unweighted response rate was 76.1 percent, with a weighted response rate of 75.6 percent. Since the faculty weighted response rate was below 85 percent for virtually all institution types, a nonresponse bias analysis was conducted for faculty members from all institution types. The nonresponse bias was estimated for the variables known for both respondents and nonrespondents within each institution type. Information on nonrespondents was obtained from the sampling frames provided by the institutions. These variables included the following:

Faculty strata:

- Non-Hispanic Black
- Hispanic
- Asian
- Other full-time females
- Other full-time males
- Other part-time faculty
- Unknown

Bureau of Economic Analysis Code (OBE) Region:

- New England CT ME MA NH RI VT
- Mid East DE DC MD NJ NY PA
- Great Lakes IL IN MI OH WI
- Plains IA KS MN MO NE ND SD
- Southeast AL AR FL GA KY LA MS NC SC TN VA WV
- Southwest AZ NM OK TX
- Rocky Mountains CO ID MT UT WY
- Far West AK CA HI NV or WA
- Outlying areas AS FM GU MH MP PR PW VI

The steps for nonresponse bias analysis included estimating the nonresponse bias and testing (adjusting for multiple comparisons) to determine if the bias is significant at the .05 level. Second, nonresponse adjustment factors were computed using a subset of variables listed above. The nonresponse adjustments were designed to significantly reduce or eliminate nonresponse bias for variables included in the corresponding models. Third, after the weights were computed, any remaining bias was estimated for the variables listed above and statistical tests were performed to determine the significance of any remaining nonresponse bias.

As shown in table B-5, the faculty weighting adjustments have reduced, and in some cases nearly eliminated, bias for faculty members for all institution types. Significant bias was reduced for the variables known for most respondents and nonrespondents, which are considered key analytical variables and correlated with many of the other variables.

Item-Level Bias Analysis

Item response rates (*RRI*) are calculated as the ratio of the number of respondents for whom an in-scope response was obtained (I^x for item x) to the number of respondents who are asked to answer that item. The number asked to answer an item is the number of unit level respondents (I) minus the number of respondents with a valid skip item for item x (V^x). When an abbreviated questionnaire⁷ is used to convert refusals, the eliminated questions are treated as item nonresponse.

$$RRI^x = \frac{I^x}{I - V^x}$$

A faculty member is defined to be an item respondent for an analytic variable if that faculty member has data for that variable, including logical imputation. Overall, the rates of missing data were low to moderate for most items. None of the items with a response rate below 85 percent were asked as part of the abbreviated questionnaire, which was administered to about 1,600 responding faculty members. Many items with a higher rate of nonresponse were items that correspond to “sensitive” questions, such as income and opinions about treatment of racial minorities.

The item response rates for the items used in this E.D. TAB are shown in table B-6. Some variables used in this E.D. TAB are composite variables derived after imputations were completed; the source variables are identified in table B-6 by noting what variable the item was used to create. For those variables listed with a response rate of less than 85 percent a nonresponse bias analysis was conducted, the results of which are summarized in table B-7. The

⁷ Thus, missing values for the approximately 1,600 faculty members who completed the abbreviated questionnaire were imputed.

Table B-5. Summary of faculty nonresponse bias analysis for NSOPF:04, by institution type

Institution type	Relative bias before weight adjustments			Relative bias after weight adjustments		
	Mean	Median	Percent significant ¹	Mean	Median	Percent significant ¹
All faculty	0.09	0.05	26.6	0.06	0.02	9.0
Public						
Doctoral	0.04	0.02	69.6	0.02	0.01	34.8
Master's	0.06	0.05	13.0	0.02	0.01	#
Baccalaureate	0.09	0.06	8.7	0.15	0.13	4.4
Associate's	0.06	0.05	26.1	0.03	0.01	4.4
Other	0.12	0.04	100.0	0.06	0.02	#
Private not-for-profit						
Doctoral	0.06	0.05	56.5	0.03	0.03	13.0
Master's	0.07	0.07	17.4	0.04	0.02	13.0
Baccalaureate	0.07	0.06	18.2	0.03	0.03	#
Associate's	0.24	0.15	35.0	0.14	0.05	10.0
Other	0.08	0.05	18.2	0.13	0.06	9.1

#Rounds to zero.

¹The percent significant reflects the ratio of the number of biased estimates to the number of biased and unbiased estimates. SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

nonresponse bias was estimated for variables known for both respondents and nonrespondents and tested (adjusting for multiple comparisons) to determine if the bias was significant at the .05 level. The percent significant reflects the ratio of the number of biased estimates to the number of biased and unbiased estimates. As noted above, respondents are often more reluctant to answer income questions, which are perceived as more personal. The high rates of significant bias shown at public doctoral granting institutions may be due to high variability in faculty salaries or low response by faculty to the income items.

Standard Errors

In order to facilitate computation of standard errors for both linear and nonlinear statistics, a vector of bootstrap sample weights has been added to the analysis file. These weights are zero for units not selected in a particular bootstrap sample; weights for other units are inflated for the bootstrap subsampling. The initial analytic weights for the complete sample are also included for the purposes of computing the desired estimates. The vector of replicate weights allows for computing additional estimates for the sole purpose of estimating a variance. Assuming *B* sets of

Table B-6. Item response rates for all NSOPF:04 faculty members for variables in this E.D. TAB, by institution type

Variable	Variable label	All faculty	Public institutions			Private not-for-profit institutions			
			Doc- total	Mas- ter's Baccal.	Asso- ciate's Other	Doc- total	Mas- ter's Baccal.	Asso- ciate's Other	
X102Z0	Institutional level	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Q16CD2	Program area (used to create X02Q16)	99.9	100.0	100.0	99.7	100.0	100.0	100.0	100.0
Q5	Employment status	100.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0
Q12	Tenure status	99.2	99.7	99.8	98.9	98.3	99.5	99.2	98.8
Q74	Race (used to create X06Q74)	98.5	98.7	98.4	99.2	98.0	98.3	98.9	99.9
Q71	Gender	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Q66A	Basic salary from institution	81.9	83.5	84.9	78.7	82.5	77.3	83.4	90.3
Q66B	Other income from institution	84.2	85.7	86.1	79.8	84.6	81.5	85.6	94.3
Q66C	Income from other academic institution (used to create Q66SUM and X06Q66)	79.0	81.6	80.1	75.1	78.0	77.4	80.9	91.0
Q66D	Outside consulting income	79.6	81.7	81.0	75.6	78.9	77.4	81.4	91.5
Q66E	Income from other employment (used to create Q66SUM and X06Q66)	79.2	81.6	80.7	75.1	78.4	77.3	80.9	91.3
Q66F	Income from other unspecified sources (used to create Q66SUM and X06Q66)	82.5	83.9	84.3	78.3	82.9	79.4	83.1	94.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Table B-7. Summary of item nonresponse bias analysis for all NSOPF:04 faculty members for variables in this E.D. TAB, by institution type

Variable/Statistics	All faculty	Public				Private not-for-profit						
		Doctoral	Master's	Baccal.	Asso- ciate's	Other	Doctoral	Master's	Baccal.	Asso- ciate's	Other	
Q66A (Basic salary from institution)												
Mean relative bias	0.03	0.03	0.06	0.03	0.07	0.03	0.09	0.03	0.04	0.05	0.06	0.06
Median relative bias	0.02	0.01	0.05	0.02	0.05	0.02	0.06	0.02	0.02	0.04	0.04	0.04
Percent significant bias	36.4	43.5	13.0	13.0	8.7	17.4	13.0	34.8	17.4	21.7	26.1	26.1
Q66B (Other income from institution)												
Mean relative bias	0.02	0.02	0.06	0.03	0.06	0.03	0.08	0.03	0.04	0.05	0.06	0.06
Median relative bias	0.02	0.02	0.05	0.02	0.05	0.02	0.06	0.02	0.02	0.04	0.04	0.04
Percent significant bias	42.4	52.2	13.0	13.0	8.7	30.4	13.0	21.7	4.4	17.4	26.1	26.1
Q66C (Income from other academic institution)												
Mean relative bias	0.03	0.03	0.06	0.03	0.07	0.03	0.09	0.04	0.04	0.05	0.07	0.07
Median relative bias	0.02	0.02	0.05	0.03	0.03	0.02	0.07	0.03	0.02	0.02	0.03	0.03
Percent significant bias	30.3	26.1	8.7	13.0	13.0	21.7	13.0	17.4	13.0	17.4	17.4	17.4
Q66D (Outside consulting income)												
Mean relative bias	0.03	0.03	0.06	0.03	0.07	0.03	0.08	0.04	0.04	0.04	0.06	0.06
Median relative bias	0.02	0.01	0.06	0.02	0.04	0.02	0.04	0.03	0.03	0.03	0.05	0.05
Percent significant bias	33.3	30.4	13.0	13.0	13.0	21.7	13.0	17.4	8.7	17.4	21.7	21.7
Q66E (Income from other employment)												
Mean relative bias	0.03	0.03	0.06	0.03	0.07	0.03	0.08	0.04	0.04	0.05	0.06	0.06
Median relative bias	0.02	0.01	0.05	0.02	0.04	0.02	0.06	0.03	0.03	0.03	0.04	0.04
Percent significant bias	27.3	30.4	4.4	13.0	13.0	21.7	13.0	17.4	8.7	17.4	17.4	17.4
Q66F (Income from other unspecified sources)												
Mean relative bias	0.03	0.02	0.06	0.03	0.07	0.03	0.07	0.04	0.04	0.05	0.06	0.06
Median relative bias	0.02	0.02	0.05	0.02	0.05	0.02	0.06	0.03	0.03	0.03	0.04	0.04
Percent significant bias	51.5	43.5	13.0	8.7	8.7	21.7	13.0	34.8	4.4	17.4	34.8	34.8

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

replicate weights, the variance of any estimate, $\hat{\theta}$, can be estimated by replicating the estimation procedure for each replicate and computing a simple variance of the replicate estimates; i.e.,

$$\text{Var}(\hat{\theta}) = \frac{\sum_{b=1}^B (\hat{\theta}_b - \hat{\theta})^2}{B}$$

where $\hat{\theta}_b$ is the estimate based on the b^{th} replicate weight and B is the number of replicates. Once the replicate weights are provided, this estimate can be produced by most survey software packages (e.g., SUDAAN [RTI 2004]).

The replicate weights were produced using a methodology and computer software developed by Kaufman (2004). This methodology allows for finite population correction factors at two stages of sampling. Application of this method incorporated the finite population correction factor at the first stage only where sampling fractions were generally high. At the second stage, where the sampling fraction was generally low, the finite population correction factor was set to 1.0.

Data Analysis System

The estimates presented in this E.D. TAB were produced using the NSOPF:04 Data Analysis System (DAS). The DAS application on the Web makes it possible for users to specify and generate their own tables. With the DAS, users can replicate or expand upon the tables presented in this E.D. TAB. In addition to the table estimates, the DAS calculates proper standard errors⁸ and weighted sample sizes for these estimates. For example, table B-8 contains standard errors that correspond to estimates in table 1 of the E.D. TAB, and table B-9 shows weighted counts for the groups analyzed in this E.D. TAB. If the number of valid cases is too small to produce a reliable estimate (fewer than 30 cases), the DAS prints the message “low n” instead of the estimate. All standard errors for estimates presented in this E.D. TAB can be viewed at <http://nces.ed.gov/DAS/library/reports.asp>. In addition to tables, the DAS will also produce a correlation matrix of selected variables to be used for linear regression models. Included in the output with the correlation matrix are the design effects (DEFTs) for each variable in the matrix. Since statistical procedures generally compute regression coefficients based on simple random sample assumptions, the standard errors must be adjusted with the design effects to take into account the stratified sampling method used in the survey.

⁸ The NSOPF:04 sample is not a simple random sample, and therefore, simple random sample techniques for estimating sampling error cannot be applied to these data. The DAS takes into account the complexity of the sampling procedures and calculates standard errors appropriate for such samples.

Table B-8. Standard errors for table 1: Percentage distribution of all faculty and instructional staff, by employment status, institution type, and program area: Fall 2003

Institution type and program area	Employment status	
	Full time	Part time
All institutions	#	#
Public doctoral	0.08	0.08
Private not-for-profit doctoral	0.16	0.16
Public master's	0.19	0.19
Private not-for-profit master's	0.13	0.13
Private not-for-profit baccalaureate	0.31	0.31
Public associate's	0.08	0.08
Other	0.47	0.47
All program areas in 4-year institutions	0.09	0.09
Agriculture/home economics	2.49	2.49
Business	2.24	2.24
Education	1.53	1.53
Engineering	2.15	2.15
Fine arts	2.08	2.08
Health sciences	1.33	1.33
Humanities	1.40	1.40
Natural sciences	1.04	1.04
Social sciences	1.28	1.28
All other fields	1.19	1.19

#Rounds to zero.

NOTE: All faculty and instructional staff includes all faculty (regardless of whether they had instructional responsibilities) and all other instructional staff.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

The DAS can be accessed electronically at <http://nces.ed.gov/DAS/>. For more information about the NSOPF:04 Data Analysis System, contact:

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Table B-9. Estimated population counts of all faculty and instructional staff, by employment status, institution type, and program area: Fall 2003

Institution type and program area	Employment status [in thousands]	
	Full time	Part time
All institutions ¹	681.8	530.0
Public doctoral ²	243.1	69.4
Private not-for-profit doctoral ²	96.2	43.9
Public master's	94.1	54.5
Private not-for-profit master's	45.5	55.5
Private not-for-profit baccalaureate	44.2	25.7
Public associate's	120.5	241.6
Other ³	38.2	39.4
All program areas in 4-year institutions	562.2	288.7
Agriculture/home economics	14.6	4.0
Business	34.7	29.6
Education	41.1	39.1
Engineering	29.4	8.2
Fine arts	36.6	32.5
Health sciences	79.2	34.5
Humanities	72.4	38.3
Natural sciences	123.9	38.1
Social sciences	60.6	25.6
All other fields	63.1	37.8

¹ All public and private not-for-profit Title IV degree-granting institutions in the 50 states and the District of Columbia.

² Doctoral includes research/doctoral institutions, and specialized medical schools and medical centers as classified by the 2000 Carnegie Classification.

³ Public baccalaureate, private not-for-profit associate's, and other specialized institutions, except medical schools and medical centers.

NOTE: All faculty and instructional staff includes all faculty (regardless of whether they had instructional responsibilities) and all other instructional staff. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Statistical Procedures

The descriptive comparisons were tested in this E.D. TAB using Student's *t* statistic. Differences between estimates are tested against the probability of a Type I error,⁹ or significance level. The significance levels were determined by calculating the Student's *t* values for the differences between each pair of means or proportions and comparing these with published tables of significance levels for two-tailed hypothesis testing.

⁹ A Type I error occurs when one concludes that a difference observed in a sample reflects a true difference in the population from which the sample was drawn, when no such difference is present.

Student's t values may be computed to test the difference between estimates with the following formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}}$$

where E_1 and E_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors. This formula is valid only for independent estimates. When estimates are not independent, a covariance term must be added to the formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2 - 2(r)se_1 se_2}}$$

where r is the correlation between the two estimates.¹⁰ This formula is used when comparing two percentages from a distribution that adds to 100. If the comparison is between the mean of a subgroup and the mean of the total group, the following formula is used:

$$t = \frac{E_{sub} - E_{tot}}{\sqrt{se_{sub}^2 + se_{tot}^2 - 2p se_{sub}^2}}$$

where p is the proportion of the total group contained in the subgroup. The estimates, standard errors, and correlations can all be obtained from the DAS.

There are hazards in reporting statistical tests for each comparison. First, comparisons based on large t statistics may appear to merit special attention. This can be misleading since the magnitude of the t statistic is related not only to the observed differences in means or percentages but also to the number of respondents in the specific categories used for comparison. Hence, a small difference compared across a large number of respondents would produce a large t statistic.

A second hazard in reporting statistical tests is the possibility that one can report a “false positive” or Type I error. In the case of a t statistic, this false positive would result when a difference measured with a particular sample showed a statistically significant difference when there is no difference in the underlying population. Statistical tests are designed to control this type of error, denoted by alpha. The alpha level of .05 selected for findings in this E.D. TAB indicates that a difference of a certain magnitude or larger would be produced no more than one time out of twenty when there was no actual difference in the quantities in the underlying

¹⁰ U.S. Department of Education, National Center for Education Statistics, A Note from the Chief Statistician, no. 2, 1993.

population. When we test hypotheses that show t values at the .05 level or smaller, we treat this finding as rejecting the null hypothesis that there is no difference between the two quantities. Failing to detect a difference, however, does not necessarily imply the values are the same or equivalent.

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