
***Appendix H: Nonresponse Analysis for Analysis
Cycles 4 Through 8***

Appendix H: Nonresponse Analysis

H.1 Overview

Establishments can cause nonresponse in the O*NET Data Collection Program at the Verification, Screening, Recruiting, or Sampling stage of selection. This nonresponse is referred to in this report as *establishment nonresponse*. Another type of nonresponse occurs at the employee level when a selected employee fails to complete and return a questionnaire (referred to as *employee nonresponse*). Finally, employees who return their questionnaires may inadvertently or intentionally skip one or more items on the questionnaire. This type of missing data is known as *item nonresponse*. These three types of nonresponse are discussed in this appendix.

The data analyzed in this report come from the Establishment Method data included in Analysis Cycles 4–8.¹ Data from the Occupation Expert (OE) Method do not lend themselves to this type of analysis, because the OE Method respondents are not sampled through establishments and are not related to a target population from which bias can be measured.

H.2 How Nonresponse Is Related to Bias

Nonresponse bias is the expected difference between an estimate from the responding cases and an estimate from all cases originally selected from the target population. The extent to which nonresponse bias occurs ultimately depends on (1) the extent of missing data and (2) the difference in an estimate between respondents and nonrespondents. For example, consider the following equation:

$$\bar{X} = p_R \bar{X}_R + p_N \bar{X}_N, \quad (1)$$

which says that an overall population estimate, \bar{X} , depends on the proportion of respondents and nonrespondents (denoted p_R and p_N , respectively, with $p_R + p_N = 1$) and the mean response from both respondents and nonrespondents (denoted \bar{X}_R and \bar{X}_N). Bias due to nonresponse is given by the following equation:

$$Bias(\bar{X}_R) = \bar{X}_R - \bar{X}, \quad (2)$$

demonstrating that bias varies as a function of the overall population estimate and the mean response from respondents. In the estimate the bias due to nonresponse increases as the difference between \bar{X}_R and \bar{X} increases. Now, substituting Equation (1) into Equation (2) gives

$$Bias(\bar{X}_R) = \bar{X}_R(1 - p_R) - p_N \bar{X}_N, \quad (3)$$

¹ A total of eight analysis cycles have been completed through June 2007. An analysis of nonresponse in Analysis Cycles 1–3 was included in the September 2, 2005, Office of Management and Budget submission (Appendix E).

and, because $1 - p_R = p_N$, Equation (3) can be expressed as

$$\text{Bias}(\bar{X}_R) = p_N (\bar{X}_R - \bar{X}_N). \quad (4)$$

Equation (4) reveals that the components of nonresponse bias depend on the proportion of nonrespondents in the eligible sample and the difference between mean responses for respondents and for nonrespondents. If either or both components are small, then the bias should also be small. Important biases usually occur when a substantial proportion of nonrespondents (p_N) exist and there is a large difference between the mean responses (Kish, 1965). When one uses sample data to approximate bias, the components p_N , \bar{X}_R , and \bar{X}_N can be estimated with sample data across attributes that can be measured for both respondents and nonrespondents. Unless a special nonresponse follow-up study is conducted, it is rarely possible to measure any of the primary study outcome variables on the nonrespondents; if one had such data, they would be on respondents. Thus, to obtain surrogates for the primary outcome variables, it is necessary to turn to other variables that are available for both respondents and nonrespondents. If respondent data indicate that the surrogate variables are related to the primary outcome variables, then any nonresponse bias, or lack thereof, observed in the surrogate variables can be inferred to the primary outcome variables. Such approximations are not deterministic but can evidence potential nonresponse bias.

The likelihood of missing data may be related to an observed variable, such as the number of employees in a business establishment. For example, employees from larger establishments may be less likely to respond than employees from smaller establishments. Analyzing skills across jobs within an occupation could therefore be subject to bias if the work performed differs systematically by establishment size—that is, if employees in larger establishments tend to respond differently from employees in smaller establishments. In this hypothetical example, employees in larger establishments may be less likely to respond; if they do respond, they may respond differently from employees in smaller establishments. This situation would cause both components of nonresponse bias (p_N and $\bar{X}_R - \bar{X}_N$) to be magnified.

In general, restricting an analysis to only those cases that are observed may introduce bias into the results unless the missing data mechanism is accounted for in the analysis (Graham, Hofer, & Piccinin, 1994; Little & Rubin, 1987; Schafer, 2000). Weighting is one common method of adjusting for nonresponse patterns based on observed values (Little & Rubin). The O*NET Data Collection Program incorporates weighting as one method to protect against the influence of nonresponse bias.²

H.3 Establishment Nonresponse

Exhibit H-1 (at the end of this appendix) displays the establishment eligibility and response rates for Analysis Cycles 4–8 by stage of data collection. The analysis population of establishments included each establishment that had at least one of its assigned occupations published in these analysis cycles, whether or not any of the occupations were eventually selected from the establishment. The response rates are presented separately by various variables to allow examination of the possibility of nonresponse bias.

² For a discussion of weighting, see Section B.1.1 in the main body of the Supporting Statement.

These variables were selected because they were available for both respondents and nonrespondents and were likely to be related to the primary outcome variables of the O*NET Program. Rates marked with an asterisk (*) are significantly different from the overall rates (where the overall rates are assumed to be fixed quantities).³

The following describes the columns in Exhibit H-1:

- **Total Estab** is the total number of selected establishments at the Verification stage.
- **Verification, Screening, Recruiting, and Sampling** refer to the four stages of data collection used in recruiting establishments. Only those establishments that responded at the previous stage were used in computing rates. For example, Screening rates reflect only establishments that responded at the Verification stage. For the very first wave of data collection, Wave 1.1, there was no distinction between the Verification and Screening stages. These establishments were all considered eligible and responding at the Verification stage in this analysis. Final rates are compounded rates across all stages of data collection.
- **Elig** is the percentage of establishments that are considered eligible. Establishments are considered survey-eligible if they are classified as (1) at the same street address or building, (2) in business (permanently or temporarily), (3) able to be located, and (4) not a duplicate.
- **Resp** is the percentage of eligible establishments that are considered respondents; that is, they did not refuse to participate in the study.

The following describes the rows in Exhibit H-1:

- **Census Division** is assigned according to the address of the establishment. A total of 180 Wave 1.1 establishments from the analysis population had no address information because they went out of business between the time the initial sample frame was constructed and the onset of data collection. There was an additional establishment in Wave 5.62 that could not be located, so it was presumed to be out of business. These establishments were declared ineligible at the Screening stage and were assigned to the Unknown Census division, where the eligibility rate at the Screening stage is 0%. Note that this group of initially ineligible establishments also affects the Time Zone and Metropolitan Status rows, where they were treated similarly.
- **Total Employees in Establishment** is the establishment total employment estimate on the sample frame. The category Unknown for total employees in an establishment is an actual frame classification.
- **SIC Division** is the Standard Industry Classification of the establishment.
- **Number of SOCs on Establishment Sampling List** is the number of Standard Occupational Classifications linked to an establishment's sampling list. This number may be viewed as a measure of the point of contact's (POC's) perceived level of burden.
- **Time Zone** and **Metropolitan Status** were assigned according to the establishment's zip code.

³ The tests were conditioned on the overall rates because the objective was to identify any subgroups that differed from the observed overall rate.

H.3.1 Establishment Final Unweighted Response Rates

The data in Exhibit H-1 show that the final unweighted response rate for establishments was 74.8% and the final eligibility rate was 83.0%.⁴ The data also indicate that response rates varied for the four data collection stages, with the lowest response rate occurring at the Recruiting stage (84.7%) and the lowest eligibility rate occurring at the Verification (87.1%) stage. These results are intuitive for the following reasons:

- It was not until the Recruiting stage of data collection that the POC fully realized the burden involved in participation. Consequently, it was expected that most nonresponse would occur at this stage.
- The lowest eligibility rate is expected at the Verification stage because this is the first contact made with each establishment and the point at which one learns of establishments that have gone out of business. However, as discussed, for Wave 1.1 a Verification call was not conducted but was combined with the Screening stage. Thus, establishments that were out of business were identified at the Screening stage for Wave 1.1. In Exhibit H-1, all establishments from Wave 1.1 were considered eligible at the Verification stage.

Using frame information, one can compare the respondents and nonrespondents across various attributes to approximate nonresponse bias. An estimate of the first component of nonresponse bias can be found in Exhibit H-1 under the column headed Final Respondent. Low response rates indicate potential nonresponse bias. With the final unweighted response rate considered a fixed quantity with no variance, the response rate for each level of a specific attribute was assessed against the overall value to determine if the difference was significant. Differences statistically significant at the 0.05 level are indicated with an asterisk (*). The results indicate the following:

- **Census Division.** It appears that establishments in the Mountain (78.4%) region had the highest significant final response rate, while the Middle Atlantic (71.8%) region had the lowest significant final response rate.
- **Total Employees in Establishment.** If one ignores the Unknown category, there appears to be a decreasing trend in the final response rates as the size of the establishment increases. This pattern suggests that the perceived burden of the POCs in smaller establishments may have been lower than the perceived burden of the POCs in larger establishments. In addition, in larger organizations the decision to participate may not be at the discretion of the POC but instead may involve corporate approval. This observation is consistent with other literature, such as Willimack, Nichols, and Sudman (2002).
- **SIC Division.** Comparing the different SIC divisions to the overall final response rate, one can see that the Public Administration (85.3%) and Mining (82.8%) industries had the highest significant final response rates, while the Finance, Insurance, and Real Estate (67.2%) industry had the lowest final response rate. Response rate patterns by industry were highly dependent on the occupations included in a particular collection of occupations. Thus, these findings would not necessarily apply to a different set of occupations in another set of analysis cycles.
- **Number of SOCs on Establishment Sampling List.** At the Recruiting stage, the response rate for establishments with one to five occupations on the sampling list (88.8%) was significantly

⁴ Unweighted rates were used because appropriate weights were not available for ineligible or nonresponding establishments.

higher than the overall response rate of 84.7%, while all the remaining categories were significantly lower than the overall rate. This pattern may indicate that the POC perceives a lower number of O*NET occupations as less of a burden. Otherwise there is no discernible trend in the final response rates by number of occupations.

- **Metropolitan Status.** Compared with the overall response rate, rural establishments (80.1%) had a final response rate significantly higher than the overall response rate, while urban establishments (73.4%) had a significantly lower final response rate.

H.3.2 Comparison of Establishment Respondents and Nonrespondents

Exhibit H-2 shows a comparison of the distribution of respondents and nonrespondents across various establishment attributes. The column Difference in Percent (Respondents Versus Nonrespondents) shows an estimate of the second component of nonresponse bias. As already discussed, a potential source of nonresponse bias occurs when this difference becomes large. An estimate of the nonresponse bias across an attribute (see Equations [2] and [4]) is shown under the last column, Difference in Percent (Respondents Versus Overall). Differences marked with an asterisk are statistically different from zero at the 0.05 level. Large positive or negative values indicate possible nonresponse bias. Although there are numerous statistically significant differences, the large sample sizes mean that very small differences likely can be statistically detected. In this situation, it is important to determine if the differences are of sufficient magnitudes to be meaningful. For establishment nonresponse, the differences between respondents and overall sample do not appear to be meaningful:

- Approximately 82.6% of the attributes had an absolute bias of less than 1 percentage point.
- Approximately 13.0% of the attributes had an absolute bias between 1 and 2 percentage points.
- Approximately 4.3% of the attributes had an absolute bias greater than 2 percentage points.

Another measure of potential nonresponse bias is the effect size, as defined by Cohen (1988). In this case, the effect size is related to the chi-square test for comparing the equivalence of percentage distributions from respondents and the overall sample for the variables listed in Exhibit H-2. Cohen classifies an effect size as “small” when it is about 0.10, as “medium” when it is about 0.30, and as “large” when it is about 0.50. For the variables in Exhibit H-2, all of the effect sizes were small, with the largest effect size equal to 0.11 for Number of SOCs on Establishment Sampling List. This result suggests that the distribution of the variables for respondents and nonrespondents is quite similar (i.e., $\bar{X}_R - \bar{X}_N$ is small).

The combination of small absolute biases and very small effect sizes indicates a low likelihood of bias due to establishment nonresponse.

H.4 Employee Nonresponse

Exhibit H-3 displays the unweighted response rates for employees from Establishment Method data collection for occupations published in Analysis Cycles 4–8.⁵ The columns in Exhibit H-3 are as follows:

⁵ Unweighted rates were used because appropriate weights were not available for nonresponding employees.

- **Sampled** is the total number of selected employees.
- **Response Rate** is the unweighted percentage of selected employees from the employee analysis population. Employees are considered respondents if they returned a questionnaire that satisfied all completeness and quality requirements.

In addition to the categories displayed in Exhibit H-1, Exhibit H-3 also displays response rates by the following employee-level characteristics (rows):

- **Selected Employees in Establishment** is the number of employees who were selected from the establishment. Note that this value ranges from only 1 to 20. This range reflects our rule that no more than 20 employees could be selected from any single establishment per 12-month period.
- **Questionnaire Type** is the type of questionnaire that the employee was selected to complete (Skills, Work Activities, Work Context, or Knowledge).
- **Occupation Class** is derived from the first two digits of the O*NET SOC.

The response rates are presented separately by the various row variables to allow examination of the possibility of nonresponse bias. These variables were selected because they were available for both respondents and nonrespondents and were likely to be related to the primary outcome variables of the O*NET Program.

H.4.1 Employee Response Rates

Like establishment nonresponse, employee nonresponse is difficult to thoroughly characterize in the O*NET Data Collection Program because relatively little information is known about the nonrespondents (except for some descriptive frame characteristics). However, as with the establishment level, using information known about both responding and nonresponding employees enables indirect determination of whether the nonrespondents are different from the respondents across variables that may be highly correlated with the survey data being collected. Thus, potential sources of nonresponse bias can be approximated at the employee level.

An estimate of the first component of nonresponse bias can be found in Exhibit H-3 under the column headed Response Rate. Low response rates indicate possible nonresponse bias. With the final unweighted response rate considered a fixed quantity with no variance, the response rate for each level of a specific covariate was assessed against the overall value to determine if the difference was significant. Differences statistically significant at the 0.05 level are indicated with an asterisk (*).⁶ The unweighted results indicate the following:

- **Census Division.** Employees in the East South Central (68.1%) division had the highest significant response rates, and employees in the Pacific division had the lowest significant response rates (59.6%).
- **Total Employees in Establishment.** Employee response rate is highest for establishments with 1 to 4 employees (71.0%) and is lowest for establishments with more than 5,000 employees (47.8%).

⁶ The tests were conditioned on the overall rates because the objective was to identify any subgroups that differed from the observed overall rate.

- **Selected Employees.** Much variation exists in the response rate across the number of selected employees with no clear pattern evident.
- **Questionnaire Type.** The response rates do not appear to vary greatly across questionnaire type, with the highest response rate (66.4%) associated with the Work Context Questionnaire and the lowest response rate (62.4%) associated with the Work Activities Questionnaire. The response rates for the Skills Questionnaire and Knowledge Questionnaire were not significantly different from the overall rate.
- **SIC Division.** The Non-Classifiable division (74.6%) had the highest significant response rate when compared with the overall response rate, while Construction (51.9%) had the lowest significant response rate.
- **Occupation Class.** Compared with the overall response rate, Community and Social Services Occupations (78.7%) and Management Occupations (73.7%) had the highest significant response rates, while Healthcare Practitioners and Technical Occupations (51.7%) and Construction and Extraction Occupations (52.2%) had the lowest significant response rates.
- **Number of SOCs on Establishment Sampling List.** There is no clear pattern in the employee response rate by the number of occupations on the establishment sampling list.
- **Time Zone.** The response rate for Pacific Standard Time (59.5%) was significantly lower than the overall response rate, while the response rate for Eastern Standard Time was significantly higher (65.1%). All other response rates for the different time zones were not significantly different from the overall response rate.
- **Metropolitan Status.** The findings at the employee level were similar to the findings at the establishment level. That is, the overall response rate for employees from rural areas was significantly higher than that for employees from urban areas.

H.4.2 Comparison of Employee Respondents and Nonrespondents

Exhibit H-4 presents a comparison of the distribution of respondents and nonrespondents across various employee attributes. The column Difference in Percent (Respondents Versus Nonrespondents) shows an estimate of the second component of nonresponse bias. As already discussed, a potential source of nonresponse bias occurs when this difference becomes large. The column Difference in Percent (Respondents Versus Overall) shows an estimate of the nonresponse bias across an attribute (see Equations [2] and [4]). Respondent Versus Overall differences marked with an asterisk are statistically different from zero at the 0.05 level. Large positive or negative values indicate possible nonresponse bias. Although there are numerous statistically significant differences, the large sample sizes mean that very small differences likely can be statistically detected. In this situation, it is important to determine if the differences are of sufficient magnitudes to be meaningful. For employee nonresponse, the differences between respondents and the overall sample do not appear to be meaningful, as the following examples indicate:

- Approximately 88.9% of the attributes had an absolute bias of less than 1 percentage point.⁷
- Approximately 7.8% of the attributes had an absolute bias between 1 and 2 percentage points.
- Approximately 3.3% of the attributes had an absolute bias greater than 2 percentage points.

⁷ Absolute value of the last column in Exhibit H-4.

Another measure of the possibility for nonresponse bias is the effect size, as defined by Cohen (1988). In this case, the effect size is related to the chi-square test for comparing the equivalence of percentage distributions from respondents and overall sample for the variables listed in Exhibit H-4. Cohen classified an effect size as “small” when it is about 0.10, as “medium” when it is about 0.30, and as “large” when it is about 0.50. For the variables in Exhibit H-4, all of the effect sizes were small, with the largest equal to 0.10 for SIC Division and Occupation Class. As previously noted, a small effect size suggests that the distribution of the variables for respondents and nonrespondents is quite similar (i.e., $\bar{X}_R - \bar{X}_N$ is small). The combination of small absolute biases and very small effect sizes indicates a low likelihood of bias due to employee nonresponse.

H.5 Item Nonresponse

Exhibits H-5 through H-12 display unweighted item response rates by item, item type, and occupation for Establishment Method data included in Analysis Cycles 4–8. These tables include questionnaire data from employee respondents in the 451 occupations published in these analysis cycles and completed under the Establishment Method. Only items from those questionnaires that satisfied all completeness and quality requirements were evaluated. Cases that did not satisfy such requirements were included as employee nonrespondents.

Item nonresponse is analogous to partial information patterns in which some variables are observed and some are missing. Even though partial information is present, item nonresponse can still create biased parameter estimation if the missing values are systematically related to the outcome (e.g., wealthy respondents tend to leave an income question missing). The results indicate the following:

- **Skills, Work Activities, Work Context, and Knowledge.** The data in Exhibits H-5 through H-8 suggest that for the Skills, Work Activities, and Work Context Questionnaires, there is little item nonresponse with respect to a single item on each questionnaire. The minimum response rate for any specific item in the Skills Questionnaire is 93.6% (Item 22—Level), 94.7% for the Work Activities Questionnaire (Item 40—Level), 98.0% for the Work Context Questionnaire (Item 49), and 90.3% for the Knowledge Questionnaire (Item 8—Level). In addition, as seen in Exhibit H-11, item nonresponse is slightly more prevalent for Level items than for Importance items, regardless of questionnaire type.
- **Occupation-Specific Tasks.** The items in the Task Questionnaire are different from the items in the other domain questionnaires in that each task applies to only one specific occupation. Participants indicate whether a task is “not relevant” to their occupation; if the task is “relevant,” they rate it on scales of frequency of performance and importance to the occupation. It should be noted that the eligible sample size for some tasks can be small because participants are instructed not to respond to the corresponding Frequency and Importance items if they do not consider the task to be “relevant” to their occupation. Tasks with a high percentage of “not relevant” responses from participants are removed from the occupation’s published task list. In particular, all task items included in Exhibit H-9 were withheld from publication because of high percentages of “not relevant” responses.
- **Background Questionnaire.** In Exhibit H-10, the item response rates appear to be nearly constant and high (more than 93%), with the exception of Item 4 (82.9%), which elicits information from the respondent about working in a family business.
- **Item Type.** All the response rates by item type in Exhibit H-11 exceed 95%.

- **Occupation.** Item response rates are provided in Exhibit H-12 for all occupations completed in Analysis Cycles 4–8. The overall item response rate is 97.9%, with the smallest response rate, 92.4%, coming from Sewing Machine Operators (SOC 51-6031.00), and the largest, 99.4%, coming from both Health Specialties Teachers, Postsecondary (SOC 25-1071.00) and Broadcast News Analysts (SOC 27-3021.00).

The extremely high item response rates indicate a low likelihood of bias due to item nonresponse.

H.6 Conclusion

Unit and item nonresponse can lead to biased inferences if the nonresponse rates are high and respondents and nonrespondents differ with regard to the characteristics of interest. An examination of both establishment and employee response rates found that nonresponse patterns were somewhat related to essentially all variables considered in the analyses. However, when the distribution of respondents and nonrespondents across various frame attributes was examined, the overall potential for nonresponse bias at both the establishment and employee levels was found to be negligible. Because nonresponse patterns for both establishments and employees are related to the substantive variables measured in the study, using these variables for nonresponse adjustments to the analysis weights should be effective in reducing the minimal effects, if any, due to nonresponse bias in the analysis.

At the item level, it was found that different questionnaire types and questions exhibited varying response rates, and in most cases the response rates were extremely high. This finding coincides with the findings at the establishment and employee levels—that is, that the potential for significant nonresponse bias due to item nonresponse is negligible.

Exhibit H-1. Establishment Eligibility and Response Rates

Category	Total Estab	Verification		Screening		Recruiting		Sampling		Final	
		Elig	Resp	Elig	Resp	Elig	Resp	Elig	Resp	Elig	Resp
Total	119,964	87.1	96.3	96.9	94.8	98.3	84.7	99.8	96.9	83.0	74.8
Census Division											
New England	6,229	87.8	96.2	96.9	95.0	98.5	83.7*	99.7	96.5	83.8	73.5*
Middle Atlantic	15,519	87.4	96.2	96.9	93.5*	98.3	82.8*	99.9	96.7	83.4	71.8*
East North Central	18,039	88.8*	96.6	97.2*	94.6	98.3	84.2	99.9	96.8	85.0*	74.4
West North Central	8,634	89.1*	97.2*	97.6*	95.8*	98.4	85.9*	99.7	97.0	85.5*	77.4*
South Atlantic	21,750	86.2*	96.3	96.9	95.1*	98.3	84.9	99.8	97.0	82.2*	75.2
East South Central	7,007	88.3*	97.3*	97.3*	95.3*	98.4	85.1	99.8	97.1	84.5*	76.5*
West South Central	13,905	86.6	96.0	97.1	95.0	98.4	85.6*	99.8	96.7	82.8	75.2
Mountain	8,753	86.3*	96.9*	97.4*	96.0*	98.6	86.9*	99.8	97.3	82.9	78.4*
Pacific	19,947	85.4*	95.5*	96.6	94.1*	98.1*	84.7	99.8	97.3*	81.1*	73.8*
Unknown	181	99.4*	100.0	0.0	NA	NA	NA	NA	NA	0.0	NA
Total Employees in Establishment											
Unknown	3,352	79.2*	95.3*	97.0	95.6	99.0*	91.6*	99.9	98.7*	76.2*	82.1*
1-4	27,725	76.9*	90.8*	95.2*	95.2*	98.6*	89.0*	99.9*	99.3*	72.6*	75.9*
5-9	8,797	87.0	96.8*	94.5*	95.3*	98.6	88.7*	99.9	98.2*	81.2*	80.1*
10-49	26,639	89.1*	97.8*	97.2*	95.4*	98.4	87.1*	99.8	97.8*	85.3*	79.3*
50-99	15,860	91.7*	98.5*	98.1*	95.6*	97.9*	86.3*	99.6*	97.2	87.9*	78.8*
100-249	7,585	91.6*	98.0*	97.4*	94.8	98.0	83.4*	99.8	95.9*	87.4*	74.1
250-499	16,391	91.1*	97.3*	98.1*	93.8*	98.4	79.5*	99.8	94.5*	87.9*	68.3*
500-999	7,403	92.2*	98.2*	97.5*	93.0*	98.7*	77.9*	99.8	93.3*	88.7*	66.3*
1,000-4,999	5,636	94.2*	98.2*	96.8	93.0*	97.8*	72.0*	99.7	92.0*	89.2*	60.3*
5,000 +	576	94.1*	97.2	94.5*	91.2*	94.3*	64.5*	99.6	88.7*	84.4	50.2*

continued

Exhibit H-1. Establishment Eligibility and Response Rates (continued)

Category	Total Estab	Verification		Screening		Recruiting		Sampling		Final	
		Elig	Resp	Elig	Resp	Elig	Resp	Elig	Resp	Elig	Resp
SIC Division											
Agriculture, Forestry, Fishing	4,951	82.9*	93.4*	97.8*	96.2*	97.5*	87.7*	99.7	98.5*	79.1*	77.2*
Mining	3,996	83.5*	96.4	97.7*	96.1*	99.1*	91.0*	99.9*	98.3*	80.9*	82.8*
Construction	10,455	85.2*	93.5*	94.8*	92.8*	97.8*	83.4*	99.6*	97.4*	79.3*	70.0*
Manufacturing	23,233	87.8*	98.0*	97.7*	94.1*	98.4	84.4	99.8	96.6*	84.4*	75.0
Transportation, Communication, Electric, Gas, and Sanitary Services	11,098	86.0*	96.1	97.2	94.7	98.3	84.7	99.6*	96.1*	82.1*	73.9*
Wholesale Trade	2,549	85.5*	97.9*	96.0*	94.0	98.4	85.6	99.8	97.2	80.9*	76.4
Retail Trade	6,545	89.5*	93.4*	96.1*	93.5*	97.8*	81.8*	99.8	97.1	84.4*	68.9*
Finance, Insurance, Real Estate	6,346	88.5*	96.8*	95.1*	92.3*	97.0*	78.9*	99.8	95.8*	82.0*	67.2*
Services	38,837	85.9*	96.0*	96.6*	95.0	98.6*	84.2*	99.9*	96.8	82.0*	74.1*
Public Administration	7,945	92.7*	98.8*	97.5*	98.3*	98.6*	90.2*	99.8	97.3*	89.1*	85.3*
Non-Classifiable	4,009	94.7*	99.1*	99.6*	96.9*	99.2*	86.0*	99.8	98.2*	93.4*	80.9*
Number of SOCs on Establishment Sampling List											
1-5	83,430	85.0*	96.2*	98.0*	95.4*	98.2*	88.8*	99.8	98.5*	81.8*	80.1*
6	4,093	88.7*	95.7	96.5	91.8*	99.4*	81.4*	99.7	95.5*	85.1*	68.1*
7	3,558	89.9*	95.9	96.8	93.6*	98.9*	76.6*	99.8	93.9*	86.1*	64.4*
8	2,666	91.3*	96.4	94.4*	93.1*	99.1*	75.7*	99.9	93.3*	85.6*	63.2*
9	3,211	95.1*	97.4*	90.1*	94.1	98.0	77.0*	99.9*	92.9*	84.4*	65.3*
10	23,006	92.3*	96.9*	94.5*	93.5*	98.5*	74.4*	99.8	92.1*	86.1*	61.9*
Time Zone											
Eastern Standard Time	55,539	87.2	96.3	97.0	94.6	98.4	84.0*	99.8	96.8	83.3	73.9*
Central Standard Time	35,080	88.0*	96.7*	97.2*	95.1*	98.4	85.3*	99.8	96.8	84.2*	75.8*
Mountain Standard Time	8,065	86.3*	96.8*	97.4*	96.1*	98.7*	87.4*	99.8	97.3	83.0	79.0*
Pacific Standard Time	19,833	85.3*	95.5*	96.6	94.0*	98.1*	84.3	99.8	97.3*	81.0*	73.3*
Alaska Standard Time	717	87.9	97.8*	97.1	98.2*	98.6	89.6*	100.0	96.7	84.2	83.1*
Hawaii Standard Time	532	88.0	96.4	98.0	95.9	97.4	86.2	100.0	98.3*	84.2	78.1
Unknown	198	99.0*	100.0	8.2*	100.0	18.8*	66.7	100.0	100.0	1.5*	66.7
Metropolitan Status											
Rural	23,592	89.0*	97.0*	97.8*	96.4*	99.0*	87.8*	99.9*	97.7*	86.2*	80.1*
Urban	96,174	86.6*	96.2*	96.8	94.4*	98.2*	83.9*	99.8	96.7*	82.4*	73.4*
Unknown	198	99.0*	100.0	8.2*	100.0	18.8*	66.7	100.0	100.0	1.5*	66.7

Notes: Response rates were calculated from those establishments that were classified as eligible at each step. The final eligibility and response rates are compounded rates across all steps of data collection. NA = not applicable.

*Statistically different from the total category at the 0.05 level.

Exhibit H-2. Comparison of Establishment Respondents and Nonrespondents

Category	Respondents		Nonrespondents		Overall		Diff in Percent (Resps vs. Nonresps)	Diff in Percent (Resps vs. Overall)
	No.	%	No.	%	No.	%		
Total	74,503	100.0	25,123	100.0	99,626	100.0	NA	NA
Census Division^a								
New England	3,836	5.1	1,383	5.5	5,219	5.2	-0.4	-0.1
Middle Atlantic	9,292	12.5	3,656	14.6	12,948	13.0	-2.1	-0.5*
East North Central	11,400	15.3	3,932	15.7	15,332	15.4	-0.3	-0.1
West North Central	5,715	7.7	1,669	6.6	7,384	7.4	1.0	0.3*
South Atlantic	13,439	18.0	4,434	17.6	17,873	17.9	0.4	0.1
East South Central	4,530	6.1	1,394	5.5	5,924	5.9	0.5	0.1
West South Central	8,667	11.6	2,852	11.4	11,519	11.6	0.3	0.1
Mountain	5,688	7.6	1,568	6.2	7,256	7.3	1.4	0.4*
Pacific	11,936	16.0	4,235	16.9	16,171	16.2	-0.8	-0.2
Total Employees in Establishment^b								
Unknown	2,098	2.8	457	1.8	2,555	2.6	1.0	0.3*
1-4	15,288	20.5	4,851	19.3	20,139	20.2	1.2	0.3
5-9	5,725	7.7	1,419	5.6	7,144	7.2	2.0	0.5*
10-49	18,024	24.2	4,701	18.7	22,725	22.8	5.5	1.4*
50-99	10,985	14.7	2,957	11.8	13,942	14.0	3.0	0.8*
100-249	4,914	6.6	1,716	6.8	6,630	6.7	-0.2	-0.1
250-499	9,840	13.2	4,567	18.2	14,407	14.5	-5.0	-1.3*
500-999	4,353	5.8	2,216	8.8	6,569	6.6	-3.0	-0.8*
1,000-4,999	3,032	4.1	1,997	7.9	5,029	5.0	-3.9	-1.0*
5,000 +	244	0.3	242	1.0	486	0.5	-0.6	-0.2*
SIC Division								
Agriculture, Forestry, Fishing	3,025	4.1	893	3.6	3,918	3.9	0.5	0.1
Mining	2,677	3.6	556	2.2	3,233	3.2	1.4	0.3*
Construction	5,801	7.8	2,487	9.9	8,288	8.3	-2.1	-0.5*
Manufacturing	14,718	19.8	4,895	19.5	19,613	19.7	0.3	0.1
Transportation, Communication, Electric, Gas, and Sanitary Services	6,729	9.0	2,380	9.5	9,109	9.1	-0.4	-0.1
Wholesale Trade	1,574	2.1	487	1.9	2,061	2.1	0.2	0.0
Retail Trade	3,810	5.1	1,716	6.8	5,526	5.5	-1.7	-0.4*
Finance, Insurance, Real Estate	3,496	4.7	1,705	6.8	5,201	5.2	-2.1	-0.5*
Services	23,604	31.7	8,248	32.8	31,852	32.0	-1.1	-0.3
Public Administration	6,037	8.1	1,042	4.1	7,079	7.1	4.0	1.0*
Non-Classifiable	3,032	4.1	714	2.8	3,746	3.8	1.2	0.3*

continued

**Exhibit H-2. Comparison of Establishment Respondents and Nonrespondents
(continued)**

Category	Respondents		Nonrespondents		Overall		Diff in Percent (Resps vs. Nonresps)	Diff in Percent (Resps vs. Overall)
	No.	%	No.	%	No.	%		
Number of SOCs on Establishment Sampling List^d								
1-5	54,684	73.4	13,584	54.1	68,268	68.5	19.3	4.9*
6	2,373	3.2	1,112	4.4	3,485	3.5	-1.2	-0.3*
7	1,972	2.6	1,092	4.3	3,064	3.1	-1.7	-0.4*
8	1,442	1.9	839	3.3	2,281	2.3	-1.4	-0.4*
9	1,769	2.4	940	3.7	2,709	2.7	-1.4	-0.3*
10	12,263	16.5	7,556	30.1	19,819	19.9	-13.6	-3.4*
Time Zone^e								
Eastern Standard Time	34,201	45.9	12,086	48.1	46,287	46.5	-2.2	-0.6*
Central Standard Time	22,387	30.0	7,146	28.4	29,533	29.6	1.6	0.4
Mountain Standard Time	5,287	7.1	1,403	5.6	6,690	6.7	1.5	0.4*
Pacific Standard Time	11,774	15.8	4,287	17.1	16,061	16.1	-1.3	-0.3
Alaska Standard Time	502	0.7	102	0.4	604	0.6	0.3	0.1
Hawaii Standard Time	350	0.5	98	0.4	448	0.4	0.1	0.0
Unknown	2	0.0	1	0.0	3	0.0	-0.0	-0.0
Metropolitan Status^f								
Rural	16,294	21.9	4,051	16.1	20,345	20.4	5.7	1.4*
Urban	58,207	78.1	21,071	83.9	79,278	79.6	-5.7	-1.4*
Unknown	2	0.0	1	0.0	3	0.0	-0.0	-0.0

Notes: Because of rounding, the difference columns may not match their constituent parts. NA = not applicable.

^a Effect size = 0.02.

^b Effect size = 0.08.

^c Effect size = 0.04.

^d Effect size = 0.11.

^e Effect size = 0.02.

^f Effect size = 0.03.

* Statistically different from the total category at the 0.05 level.

Exhibit H-3. Employee Response Rates

Category	Sampled	Response Rate
Total	104,376	64.2
Census Division		
New England	5,688	66.2
Middle Atlantic	12,478	63.9
East North Central	17,734	65.8*
West North Central	8,851	67.2*
South Atlantic	21,059	64.1
East South Central	8,192	68.1*
West South Central	10,079	62.2*
Mountain	7,025	62.5
Pacific	13,270	59.6*
Total Employees in Establishment		
Unknown	1,451	63.2
1-4	6,962	71.0*
5-9	3,898	63.3
10-49	21,004	61.9*
50-99	33,620	68.6*
100-249	6,611	60.4*
250-499	17,869	60.6*
500-999	7,621	61.7*
1,000-4, 999	4,892	59.2*
5,000+	448	47.8*
Selected Employees in Establishment		
1	6,011	74.7*
2	5,698	69.1*
3	5,406	65.0
4	5,276	66.7*
5	5,345	64.2
6	5,400	61.8*
7	5,068	63.2
8	34,056	61.4*
9	2,133	64.3
10	2,220	66.8
11	1,892	65.9
12	1,908	63.8
13	2,509	62.5
14	2,044	64.5
15	1,845	62.5
16	5,792	57.9*
17	833	68.3
18	1,008	68.8
19	912	64.1
20	9,020	67.8*

continued

Exhibit H-3. Employee Response Rates (continued)

Category	Sampled	Response Rate
Questionnaire Type		
Skills	26,037	64.4
Work Activities	26,374	62.4*
Work Context	25,724	66.4*
Knowledge	26,241	63.7
SIC Division		
Agriculture, Forestry, Fishing	3,691	59.1*
Mining	1,982	59.6*
Construction	6,600	51.9*
Manufacturing	25,490	64.5
Transportation, Communication, Electric, Gas, and Sanitary Services	11,822	57.4*
Wholesale Trade	1,319	61.3
Retail Trade	3,342	58.5*
Finance, Insurance, Real Estate	3,095	65.5
Services	21,182	63.2
Public Administration	5,588	66.3
Non-Classifiable	20,265	74.6*
Occupation Class		
Management Occupations	3,459	73.7*
Business and Financial Operations Occupations	3,111	65.0
Computer and Mathematical Occupations	300	68.0
Architecture and Engineering Occupations	2,075	64.7
Life, Physical, and Social Science Occupations	4,316	70.7*
Community and Social Services Occupations	1,881	78.7*
Legal Occupations	933	64.3
Education, Training, and Library Occupations	16,965	73.1*
Arts, Design, Entertainment, Sports, and Media Occupations	3,576	61.7
Healthcare Practitioners and Technical Occupations	3,498	51.7*
Healthcare Support Occupations	594	59.8
Protective Service Occupations	2,190	66.9
Food Preparation and Serving Related Occupations	1,235	53.5*
Building and Grounds Cleaning and Maintenance	2,017	64.9
Personal Care and Service Occupations	2,419	63.2
Sales and Related Occupations	1,703	56.1*
Office and Administrative Support Occupations	5,905	62.4
Farming, Fishing, and Forestry Occupations	3,054	57.8*
Construction and Extraction Occupations	8,471	52.2*
Installation, Maintenance, and Repair Occupations	6,924	64.3
Production Occupations	21,493	64.5
Transportation and Material Moving Occupations	8,257	59.3*

continued

Exhibit H-3. Employee Response Rates (continued)

Category	Sampled	Response Rate
Number of SOCs on Establishment Sampling List		
1-5	69,699	63.6
6	7,516	68.1*
7	4,232	63.3
8	1,926	63.1
9	2,169	66.4
10	18,834	64.9
Time Zone		
Eastern Standard Time	51,662	65.1*
Central Standard Time	32,017	64.9
Mountain Standard Time	6,506	63.5
Pacific Standard Time	13,051	59.5*
Alaska Standard Time	644	65.4
Hawaii Standard Time	496	56.7
Metropolitan Status		
Rural	26,188	67.8*
Urban	78,188	63.0*

*Statistically different from the total category at the 0.05 level.

Exhibit H-4. Comparison of Employee Respondents and Nonrespondents

Category	Respondents		Nonrespondents		Overall		Diff in Percent (Resps vs. Nonresps)	Diff in Percent (Resps vs. Overall)
	No.	%	No.	%	No.	%		
Total	67,017	100.0	37,359	100.0	104,376	100.0	NA	NA
Census Division^a								
New England	3,767	5.6	1,921	5.1	5,688	5.4	0.5	0.2
Middle Atlantic	7,973	11.9	4,505	12.1	12,478	12.0	-0.2	-0.1
East North Central	11,677	17.4	6,057	16.2	17,734	17.0	1.2	0.4*
West North Central	5,946	8.9	2,905	7.8	8,851	8.5	1.1	0.4*
South Atlantic	13,508	20.2	7,551	20.2	21,059	20.2	-0.1	-0.0
East South Central	5,578	8.3	2,614	7.0	8,192	7.8	1.3	0.5*
West South Central	6,267	9.4	3,812	10.2	10,079	9.7	-0.9	-0.3*
Mountain	4,393	6.6	2,632	7.0	7,025	6.7	-0.5	-0.2
Pacific	7,908	11.8	5,362	14.4	13,270	12.7	-2.6	-0.9*
Total Employees in Establishment^b								
Unknown	917	1.4	534	1.4	1,451	1.4	-0.1	-0.0
1-4	4,941	7.4	2,021	5.4	6,962	6.7	2.0	0.7*
5-9	2,467	3.7	1,431	3.8	3,898	3.7	-0.1	-0.1
10-49	13,007	19.4	7,997	21.4	21,004	20.1	-2.0	-0.7*
50-99	23,061	34.4	10,559	28.3	33,620	32.2	6.1	2.2*
100-249	3,994	6.0	2,617	7.0	6,611	6.3	-1.0	-0.4*
250-499	10,823	16.1	7,046	18.9	17,869	17.1	-2.7	-1.0*
500-999	4,699	7.0	2,922	7.8	7,621	7.3	-0.8	-0.3*
1,000-4,999	2,894	4.3	1,998	5.3	4,892	4.7	-1.0	-0.4*
5,000 +	214	0.3	234	0.6	448	0.4	-0.3	-0.1*
Total Selected Employees in Establishment^c								
1	4,490	6.7	1,521	4.1	6,011	5.8	2.6	0.9*
2	3,935	5.9	1,763	4.7	5,698	5.5	1.2	0.4*
3	3,513	5.2	1,893	5.1	5,406	5.2	0.2	0.1
4	3,521	5.3	1,755	4.7	5,276	5.1	0.6	0.2*
5	3,430	5.1	1,915	5.1	5,345	5.1	-0.0	-0.0
6	3,336	5.0	2,064	5.5	5,400	5.2	-0.5	-0.2*
7	3,202	4.8	1,866	5.0	5,068	4.9	-0.2	-0.1
8	20,915	31.2	13,141	35.2	34,056	32.6	-4.0	-1.4*
9	1,372	2.0	761	2.0	2,133	2.0	0.0	0.0
10	1,483	2.2	737	2.0	2,220	2.1	0.2	0.1
11	1,246	1.9	646	1.7	1,892	1.8	0.1	0.0
12	1,217	1.8	691	1.8	1,908	1.8	-0.0	-0.0
13	1,568	2.3	941	2.5	2,509	2.4	-0.2	-0.1

continued

Exhibit H-4. Comparison of Employee Respondents and Nonrespondents (continued)

Category	Respondents		Nonrespondents		Overall		Diff in Percent (Resps vs. Nonresps)	Diff in Percent (Resps vs. Overall)
	No.	%	No.	%	No.	%		
14	1,319	2.0	725	1.9	2,044	2.0	0.0	0.0
15	1,154	1.7	691	1.8	1,845	1.8	-0.1	-0.0
16	3,352	5.0	2,440	6.5	5,792	5.5	-1.5	-0.5*
17	569	0.8	264	0.7	833	0.8	0.1	0.1
18	694	1.0	314	0.8	1,008	1.0	0.2	0.1
19	585	0.9	327	0.9	912	0.9	-0.0	-0.0
20	6,116	9.1	2,904	7.8	9,020	8.6	1.4	0.5*
Questionnaire Type^d								
Skills	16,760	25.0	9,277	24.8	26,037	24.9	0.2	0.1
Work Activities	16,459	24.6	9,915	26.5	26,374	25.3	-2.0	-0.7*
Work Context	17,081	25.5	8,643	23.1	25,724	24.6	2.4	0.8*
Knowledge	16,717	24.9	9,524	25.5	26,241	25.1	-0.5	-0.2*
SIC Division^e								
Agriculture, Forestry, Fishing	2,180	3.3	1,511	4.0	3,691	3.5	-0.8	-0.3*
Mining	1,182	1.8	800	2.1	1,982	1.9	-0.4	-0.1*
Construction	3,428	5.1	3,172	8.5	6,600	6.3	-3.4	-1.2*
Manufacturing	16,451	24.5	9,039	24.2	25,490	24.4	0.4	0.1
Transportation, Communication, Electric, Gas, and Sanitary Services	6,781	10.1	5,041	13.5	11,822	11.3	-3.4	-1.2*
Wholesale Trade	808	1.2	511	1.4	1,319	1.3	-0.2	-0.1
Retail Trade	1,954	2.9	1,388	3.7	3,342	3.2	-0.8	-0.3*
Finance, Insurance, Real Estate	2,026	3.0	1,069	2.9	3,095	3.0	0.2	0.1
Services	13,386	20.0	7,796	20.9	21,182	20.3	-0.9	-0.3
Public Administration	3,704	5.5	1,884	5.0	5,588	5.4	0.5	0.2*
Nonclassifiable	15,117	22.6	5,148	13.8	20,265	19.4	8.8	3.1*
Occupation Class^f								
Management Occupations	2,551	3.8	908	2.4	3,459	3.3	1.4	0.5*
Business and Financial Operations Occupations	2,022	3.0	1,089	2.9	3,111	3.0	0.1	0.0
Computer and Mathematical Occupations	204	0.3	96	0.3	300	0.3	0.0	0.0
Architecture and Engineering Occupations	1,343	2.0	732	2.0	2,075	2.0	0.0	0.0

continued

Exhibit H-4. Comparison of Employee Respondents and Nonrespondents (continued)

Category	Respondents		Nonrespondents		Overall		Diff in Percent (Resps vs. Nonresps)	Diff in Percent (Resps vs. Overall)
	No.	%	No.	%	No.	%		
Life, Physical, and Social Science Occupations	3,050	4.6	1,266	3.4	4,316	4.1	1.2	0.4*
Community and Social Services Occupations	1,480	2.2	401	1.1	1,881	1.8	1.1	0.4*
Legal Occupations	600	0.9	333	0.9	933	0.9	0.0	0.0
Education, Training, and Library Occupations	12,404	18.5	4,561	12.2	16,965	16.3	6.3	2.3*
Arts, Design, Entertainment, Sports, and Media Occupations	2,206	3.3	1,370	3.7	3,576	3.4	-0.4	--0.1
Healthcare Practitioners and Technical Occupations	1,809	2.7	1,689	4.5	3,498	3.4	-1.8	-0.7*
Healthcare Support Occupations	355	0.5	239	0.6	594	0.6	-0.1	-0.0
Protective Service Occupations	1,466	2.2	724	1.9	2,190	2.1	0.2	0.1
Food Preparation and Serving Related Occupations	661	1.0	574	1.5	1,235	1.2	-0.6	-0.2*
Building and Grounds Cleaning and Maintenance Occupations	1,309	2.0	708	1.9	2,017	1.9	0.1	0.0
Personal Care and Service Occupations	1,528	2.3	891	2.4	2,419	2.3	-0.1	-0.0
Sales and Related Occupations	955	1.4	748	2.0	1,703	1.6	-0.6	-0.2*
Office and Administrative Support Occupations	3,682	5.5	2,223	6.0	5,905	5.7	-0.5	-0.2
Farming, Fishing, and Forestry Occupations	1,766	2.6	1,288	3.4	3,054	2.9	-0.8	-0.3*
Construction and Extraction Occupations	4,423	6.6	4,048	10.8	8,471	8.1	-4.2	-1.5*
Installation, Maintenance, and Repair Occupations	4,450	6.6	2,474	6.6	6,924	6.6	0.0	0.0
Production Occupations	13,858	20.7	7,635	20.4	21,493	20.6	0.2	0.1
Transportation and Material Moving Occupations	4,895	7.3	3,362	9.0	8,257	7.9	-1.7	-0.6*

continued

Exhibit H-4. Comparison of Employee Respondents and Nonrespondents (continued)

Category	Respondents		Nonrespondents		Overall		Diff in Percent (Resps vs. Nonresps)	Diff in Percent (Resps vs. Overall)
	No.	%	No.	%	No.	%		
Number of SOCs on Establishment Sampling List^a								
1-5	44,347	66.2	25,352	67.9	69,699	66.8	-1.7	-0.6*
6	5,117	7.6	2,399	6.4	7,516	7.2	1.2	0.4*
7	2,679	4.0	1,553	4.2	4,232	4.1	-0.2	-0.1
8	1,216	1.8	710	1.9	1,926	1.8	-0.1	-0.0
9	1,440	2.1	729	2.0	2,169	2.1	0.2	0.1
10	12,218	18.2	6,616	17.7	18,834	18.0	0.5	0.2
Time Zone^b								
Eastern Standard Time	33,635	50.2	18,027	48.3	51,662	49.5	1.9	0.7*
Central Standard Time	20,785	31.0	11,232	30.1	32,017	30.7	0.9	0.3
Mountain Standard Time	4,129	6.2	2,377	6.4	6,506	6.2	-0.2	-0.1
Pacific Standard Time	7,766	11.6	5,285	14.1	13,051	12.5	-2.6	-0.9*
Alaska Standard Time	421	0.6	223	0.6	644	0.6	0.0	0.0
Hawaii Standard Time	281	0.4	215	0.6	496	0.5	-0.2	-0.1
Metropolitan Statusⁱ								
Rural	17,761	26.5	8,427	22.6	26,188	25.1	3.9	1.4*
Urban	49,256	73.5	28,932	77.4	78,188	74.9	-3.9	-1.4*

Notes: Because of rounding, the difference columns may not match their constituent parts. NA = not applicable.

^a Effect size = 0.04.

^b Effect size = 0.06.

^c Effect size = 0.06.

^d Effect size = 0.02.

^e Effect size = 0.10.

^f Effect size = 0.10.

^g Effect size = 0.02.

^h Effect size = 0.03.

ⁱ Effect size = 0.03.

*Statistically different from zero at the 0.05 level.

Exhibit H-5. Ten Lowest Item Response Rate, Skills Questionnaire

Item	Item Description	Number Sampled	Response Rate (%)
A22-Level	Writing computer programs for various purposes.	5,450	93.6
A30-Level	Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.	10,286	96.4
A33-Level	Determining how money will be spent to get the work done, and accounting for these expenditures.	8,774	96.5
A29-Level	Determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes.	10,119	96.7
A34-Level	Obtaining and seeing to the appropriate use of equipment, facilities, and materials needed to do certain work.	10,384	96.7
A21-Level	Installing equipment, machines, wiring, or programs to meet specifications.	8,741	96.7
A18-Level	Analyzing needs and product requirements to create a design.	11,073	96.9
A25-Level	Controlling operations of equipment or systems.	10,971	96.9
A19-Level	Generating or adapting equipment and technology to serve user needs.	10,225	97.1
A28-Level	Repairing machines or systems using the needed tools.	9,185	97.1

Exhibit H-6. Ten Lowest Item Response Rate, Work Activities Questionnaire

Item	Item Description	Number Sampled	Response Rate (%)
B40-Level	Recruiting, interviewing, selecting, hiring, and promoting employees in an organization.	6,815	94.7
B21-Level	Providing documentation, detailed instructions, drawings, or specifications to tell others about how devices, parts, equipment, or structures are to be fabricated, constructed, assembled, modified, maintained, or used.	6,509	95.3
B05-Level	Estimating sizes, distances, and quantities; or determining time, costs, resources, or materials needed to perform a work activity.	12,021	95.7
B23-Level	Servicing, repairing, calibrating, regulating, fine-tuning, or testing machines, devices, and equipment that operate primarily on the basis of electrical or electronic (not mechanical) principles.	6,933	95.9
B32-Level	Performing for people or dealing directly with the public. This includes serving customers in restaurants and stores, and receiving clients or guests.	9,976	95.9
B02-Level	Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.	13,837	96.0
B22-Level	Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.	7,616	96.1
B41-Level	Monitoring and controlling resources and overseeing the spending of money.	9,559	96.1
B13-Level	Establishing long-range objectives and specifying the strategies and actions to achieve them.	11,990	96.1
B09-Level	Identifying the underlying principles, reasons, or facts of information by breaking down information or data into separate parts.	12,389	96.4

Exhibit H-7. Ten Lowest Item Response Rate, Work Context Questionnaire

Item	Item Description	Number Sampled	Response Rate (%)
D49	How automated is the job?	15,450	98.0
D45	How serious would the result usually be if the worker made a mistake that was not readily correctable?	15,450	98.2
D51	How important is repeating the same physical activities (e.g., key entry) or mental activities (e.g., checking entries in a ledger) over and over, without stopping, to performing this job?	15,450	98.6
D09	How important is it to coordinate or lead others in accomplishing work activities in this job?	15,450	98.7
D47	How frequently is the worker required to make decisions that affect other people, the financial resources, and/or the image and reputation of the organization?	15,450	98.7
D53	To what extent does this job require the worker to compete or to be aware of competitive pressures?	15,450	98.8
D21	To what extent does this job require the worker to perform job tasks in close physical proximity to other people?	15,450	98.9
D46	How do the decisions an employee makes impact the results of co-workers, clients or the company?	15,450	98.9
D12	How often are there conflict situations the employee has to face in this job?	15,450	99.0
D39	How much does this job require keeping or regaining your balance?	15,450	99.0

Exhibit H-8. Ten Lowest Item Response Rate, Knowledge Questionnaire

Item	Item Description	Number Sampled	Response Rate (%)
E08-Level	Knowledge of techniques and equipment for planting, growing, and harvesting food products (both plant and animal) for consumption, including storage/handling techniques.	2,382	90.3
E26-Level	Knowledge of the theory and techniques required to compose, produce, and perform works of music, dance, visual arts, drama, and sculpture.	3,432	93.4
E17-Level	Knowledge of plant and animal organisms, their tissues, cells, functions, interdependencies, and interactions with each other and the environment.	4,905	95.4
E27-Level	Knowledge of historical events and their causes, indicators, and effects on civilizations and cultures.	4,994	95.4
E12-Level	Knowledge of materials, methods, and the tools involved in the construction or repair of houses, buildings, or other structures such as highways and roads.	5,192	95.7
E25-Level	Knowledge of the structure and content of a foreign (non-English) language including the meaning and spelling of words, rules of composition and grammar, and pronunciation.	5,619	96.1
E03-Level	Knowledge of economic and accounting principles and practices, the financial markets, banking and the analysis and reporting of financial data.	7,466	96.1
E28-Level	Knowledge of different philosophical systems and religions. This includes their basic principles, values, ethics, ways of thinking, customs, practices, and their impact on human culture.	5,815	96.3
E21-Level	Knowledge of the information and techniques needed to diagnose and treat human injuries, diseases, and deformities. This includes symptoms, treatment alternatives, drug properties and interactions, and preventive health-care measures.	5,614	96.6
E10-Level	Knowledge of the practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.	8,006	96.7

Exhibit H-9. Ten Lowest Item Response Rates, Task Questionnaire

Item	Item Description	Number Sampled	Response Rate (%)
11-3031.02, Financial Managers, Branch or Department: T21-Importance	Direct floor operations of brokerage firm engaged in buying and selling securities at exchange.	1	0.0
11-9012.00, Farmers and Ranchers: T28-Importance	Maintain colonies of bees to produce honey and hive byproducts, pollinate crops, and/or produce queens and bees for sale.	1	0.0
11-9012.00, Farmers and Ranchers: T28-Frequency	Maintain colonies of bees to produce honey and hive byproducts, pollinate crops, and/or produce queens and bees for sale.	1	0.0
27-1013.00, Fine Artists, Including Painters, Sculptors, and Illustrators: T34-Frequency	Draw sketches of crime scenes, depicting such details as locations of doors and windows and exact positions of pieces of evidence.	3	0.0
27-1013.00, Fine Artists, Including Painters, Sculptors, and Illustrators: T35-Frequency	Alter, modify, or retouch photographs to update likenesses so that photographs can be used in criminal investigations.	3	0.0
27-1013.00, Fine Artists, Including Painters, Sculptors, and Illustrators: T36-Frequency	Prepare line drawings conforming to descriptions of suspects or crime scene details, presenting drawings to witnesses or victims for approval and completion of composite sketches.	3	0.0
27-1013.00, Fine Artists, Including Painters, Sculptors, and Illustrators: T23-Frequency	Gather relevant information about unidentified human remains, including photographs, bones, hair, and any other artifacts, for use in facial reconstructions.	5	20.0
53-4021.00, Railroad Brake, Signal, and Switch Operators: T25-Frequency	Collect tickets, fares, and passes from passengers.	5	20.0
27-1013.00, Fine Artists, Including Painters, Sculptors, and Illustrators: T25-Frequency	Interview crime victims or witnesses to obtain descriptive information about suspects, as well as objects such as jewelry or weapons.	4	25.0
27-1013.00, Fine Artists, Including Painters, Sculptors, and Illustrators: T32-Frequency	Show crime victims and witnesses photographs depicting different facial features, head shapes, and hair types so that those best representing suspects may be selected for use in composites.	4	25.0
51-5022.00, Prepress Technicians and Workers: T39-Frequency	Mount finished plates on wood or metal blocks, using hammers and nails or thermoplastic adhesives and heat presses.	4	25.0

Note: For items in the Task Questionnaire, participants first indicate whether a task is “not relevant” to their occupation. If a task is “not relevant,” the participants are instructed not to respond to the Frequency and Importance items. Tasks with a high percentage of “not relevant” responses from participants are removed from the occupation’s published task list. All task items in this exhibit were withheld from publication because of high percentages of “not relevant” responses.

Exhibit H-10. Response Rates, Background Questionnaire

Item	Item Description	Number Sampled	Response Rate (%)
2	How long at job?	60,486	99.3
3	Employment sector	60,486	96.0
4	Family business	60,486	82.9
5	Age group	60,486	96.9
6	Gender	60,486	98.7
7	Ethnicity	60,486	96.3
8	Race	60,486	93.9
9A	Blindness, deafness, or other severe vision or hearing impairment	60,486	98.3
9B	A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying	60,486	98.3
10A	Difficulty learning, remembering, or concentrating	60,486	95.9
10B	Difficulty bathing, or getting around inside the home	60,486	95.8
10C	Going outside the home alone to shop or visit the doctor's office	60,486	95.9
10D	Working at a job or business	60,486	95.8
11	Education level	60,486	98.8

Exhibit H-11. Item Response Rates by Item Type

Item Type	Questions	Response Rate (%)
Total	8,002,039	97.9
A: Skills—Importance	532,140	99.0
A: Skills—Level	423,718	97.8
B: Work Activities—Importance	605,816	99.1
B: Work—Activities—Level	475,869	97.0
Background	846,804	95.9
D: Work Context	880,650	99.2
E: Knowledge—Education and Training	75,280	98.4
E: Knowledge—Importance	496,848	99.0
E: Knowledge—Level	271,737	97.2
E: Knowledge—Work Styles Background	240,896	99.4
Task—Frequency	943,376	96.4
Task—Importance	943,376	97.2
Task—Relevance	1,265,529	98.8

Exhibit H-12. Item response Rates by Occupation

SOC	SOC Title	Questions	Response Rate (%)
Total		8,002,039	97.9
11-1011.00	Chief Executives	16,577	98.6
11-3031.01	Treasurers and Controllers	23,522	98.9
11-3031.02	Financial Managers, Branch or Department	7,986	98.9
11-9011.01	Nursery and Greenhouse Managers	12,181	98.6
11-9012.00	Farmers and Ranchers	15,234	97.8
11-9031.00	Education Administrators, Preschool and Child Care Center/Program	11,675	97.9
11-9032.00	Education Administrators, Elementary and Secondary School	83,695	98.7
11-9033.00	Education Administrators, Postsecondary	105,119	98.6
11-9071.00	Gaming Managers	15,611	98.3
11-9121.00	Natural Sciences Managers	11,865	98.6
11-9131.00	Postmasters and Mail Superintendents	11,083	98.6
11-9141.00	Property, Real Estate, and Community Association Managers	10,814	98.9
13-1011.00	Agents and Business Managers of Artists, Performers, and Athletes	15,463	98.0
13-1021.00	Purchasing Agents and Buyers, Farm Products	13,240	98.9
13-1031.01	Claims Examiners, Property and Casualty Insurance	14,575	98.0
13-1032.00	Insurance Appraisers, Auto Damage	11,512	97.8
13-1041.02	Licensing Examiners and Inspectors	15,339	98.2
13-1041.03	Equal Opportunity Representatives and Officers	10,557	98.0
13-1041.04	Government Property Inspectors and Investigators	8,036	98.5
13-1061.00	Emergency Management Specialists	19,180	99.2
13-1111.00	Management Analysts	9,050	98.4
13-2021.02	Appraisers, Real Estate	21,285	99.1
13-2051.00	Financial Analysts	9,089	99.1
13-2052.00	Personal Financial Advisors	12,754	98.9
13-2061.00	Financial Examiners	12,256	98.7
13-2071.00	Loan Counselors	8,704	98.2
13-2081.00	Tax Examiners, Collectors, and Revenue Agents	16,269	98.1
13-2082.00	Tax Preparers	14,089	98.0
15-1071.01	Computer Security Specialists	8,771	97.7
15-2041.00	Statisticians	12,643	98.8
17-2031.00	Biomedical Engineers	15,788	98.9
17-2061.00	Computer Hardware Engineers	8,227	98.3
17-2072.00	Electronics Engineers, Except Computer	13,661	98.6
17-2121.01	Marine Engineers	11,699	99.3
17-2121.02	Marine Architects	8,515	97.9
17-2131.00	Materials Engineers	10,863	99.2
17-2161.00	Nuclear Engineers	9,819	97.7

continued

Exhibit H-12. Item response Rates by Occupation (continued)

SOC	SOC Title	Questions	Response Rate (%)
17-3012.01	Electronic Drafters	7,993	98.5
17-3012.02	Electrical Drafters	10,189	98.4
17-3024.00	Electro-Mechanical Technicians	9,293	98.2
17-3031.01	Surveying Technicians	17,579	98.4
17-3031.02	Mapping Technicians	20,023	98.7
19-1012.00	Food Scientists and Technologists	18,525	98.7
19-1021.00	Biochemists and Biophysicists	12,776	98.8
19-1031.01	Soil Conservationists	10,254	98.8
19-1031.02	Range Managers	12,243	99.1
19-1041.00	Epidemiologists	10,505	97.6
19-1042.00	Medical Scientists, Except Epidemiologists	10,453	98.5
19-2021.00	Atmospheric and Space Scientists	15,106	98.7
19-2032.00	Materials Scientists	14,396	99.1
19-3011.00	Economists	12,344	98.2
19-3021.00	Market Research Analysts	7,529	98.7
19-3022.00	Survey Researchers	8,654	98.4
19-3031.01	School Psychologist	24,185	98.7
19-3031.02	Clinical Psychologists	14,593	98.1
19-3031.03	Counseling Psychologists	9,677	99.1
19-3032.00	Industrial-Organizational Psychologists	19,739	99.2
19-4011.01	Agricultural Technicians	9,798	97.1
19-4011.02	Food Science Technicians	34,797	97.6
19-4041.01	Geophysical Data Technicians	9,670	99.1
19-4041.02	Geological Sample Test Technicians	7,372	98.5
19-4051.01	Nuclear Equipment Operation Technicians	7,766	98.7
19-4051.02	Nuclear Monitoring Technicians	14,408	98.2
19-4061.00	Social Science Research Assistants	20,374	99.0
19-4061.01	City and Regional Planning Aides	7,968	98.7
19-4093.00	Forest and Conservation Technicians	13,010	97.9
21-1011.00	Substance Abuse and Behavioral Disorder Counselors	34,278	98.7
21-1012.00	Educational, Vocational, and School Counselors	120,919	98.6
21-1015.00	Rehabilitation Counselors	11,708	98.3
21-1091.00	Health Educators	11,432	98.1
21-2011.00	Clergy	11,586	98.9
21-2021.00	Directors, Religious Activities and Education	19,880	98.3
23-1021.00	Administrative Law Judges, Adjudicators, and Hearing Officers	11,728	98.1
23-1022.00	Arbitrators, Mediators, and Conciliators	16,724	98.7
23-1023.00	Judges, Magistrate Judges, and Magistrates	13,273	98.5
23-2091.00	Court Reporters	15,688	98.1

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Exhibit H-12. Item response Rates by Occupation (continued)

SOC	SOC Title	Questions	Response Rate (%)
23-2093.00	Title Examiners, Abstractors, and Searchers	10,688	98.5
25-1011.00	Business Teachers, Postsecondary	65,270	99.0
25-1021.00	Computer Science Teachers, Postsecondary	57,145	98.8
25-1022.00	Mathematical Science Teachers, Postsecondary	61,722	98.8
25-1031.00	Architecture Teachers, Postsecondary	26,594	98.7
25-1032.00	Engineering Teachers, Postsecondary	26,992	98.9
25-1041.00	Agricultural Sciences Teachers, Postsecondary	35,046	99.1
25-1042.00	Biological Science Teachers, Postsecondary	60,250	98.7
25-1043.00	Forestry and Conservation Science Teachers, Postsecondary	25,787	99.1
25-1051.00	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	26,446	99.1
25-1052.00	Chemistry Teachers, Postsecondary	37,872	99.1
25-1053.00	Environmental Science Teachers, Postsecondary	26,457	98.8
25-1054.00	Physics Teachers, Postsecondary	29,168	98.8
25-1061.00	Anthropology and Archeology Teachers, Postsecondary	19,678	99.0
25-1062.00	Area, Ethnic, and Cultural Studies Teachers, Postsecondary	15,305	98.7
25-1063.00	Economics Teachers, Postsecondary	22,871	98.8
25-1064.00	Geography Teachers, Postsecondary	20,019	98.7
25-1065.00	Political Science Teachers, Postsecondary	24,844	98.3
25-1066.00	Psychology Teachers, Postsecondary	55,385	99.1
25-1067.00	Sociology Teachers, Postsecondary	29,766	98.6
25-1071.00	Health Specialties Teachers, Postsecondary	24,258	99.4
25-1072.00	Nursing Instructors and Teachers, Postsecondary	26,067	98.6
25-1081.00	Education Teachers, Postsecondary	23,142	98.1
25-1082.00	Library Science Teachers, Postsecondary	33,475	98.8
25-1111.00	Criminal Justice and Law Enforcement Teachers, Postsecondary	17,908	99.1
25-1112.00	Law Teachers, Postsecondary	20,681	99.2
25-1113.00	Social Work Teachers, Postsecondary	22,698	98.3
25-1121.00	Art, Drama, and Music Teachers, Postsecondary	22,341	98.7
25-1122.00	Communications Teachers, Postsecondary	40,457	99.0
25-1123.00	English Language and Literature Teachers, Postsecondary	70,659	98.5
25-1124.00	Foreign Language and Literature Teachers, Postsecondary	31,323	98.5
25-1125.00	History Teachers, Postsecondary	38,379	98.7
25-1126.00	Philosophy and Religion Teachers, Postsecondary	30,712	98.7
25-1191.00	Graduate Teaching Assistants	14,889	98.8
25-1192.00	Home Economics Teachers, Postsecondary	14,898	99.0
25-1193.00	Recreation and Fitness Studies Teachers, Postsecondary	28,335	99.2
25-1194.00	Vocational Education Teachers Postsecondary	45,128	98.7
25-2011.00	Preschool Teachers, Except Special Education	39,097	96.0
25-2012.00	Kindergarten Teachers, Except Special Education	34,560	98.5

continued)

Exhibit H-12. Item response Rates by Occupation (continued)

SOC	SOC Title	Questions	Response Rate (%)
25-2021.00	Elementary School Teachers, Except Special Education	39,992	98.6
25-2022.00	Middle School Teachers, Except Special and Vocational Education	95,310	98.4
25-2023.00	Vocational Education Teachers, Middle School	35,910	98.0
25-2031.00	Secondary School Teachers, Except Special and Vocational Education	33,431	98.4
25-2032.00	Vocational Education Teachers, Secondary School	53,873	98.4
25-2041.00	Special Education Teachers, Preschool, Kindergarten, and Elementary School	37,028	98.4
25-2042.00	Special Education Teachers, Middle School	69,489	98.7
25-2043.00	Special Education Teachers, Secondary School	40,646	98.9
25-3011.00	Adult Literacy, Remedial Education, and GED Teachers and Instructors	37,364	98.2
25-3021.00	Self-Enrichment Education Teachers	19,307	97.9
25-4011.00	Archivists	12,085	98.5
25-9031.00	Instructional Coordinators	21,561	98.8
25-9041.00	Teacher Assistants	84,806	97.6
27-1013.00	Fine Artists, Including Painters, Sculptors, and Illustrators	17,152	98.0
27-1014.00	Multi-Media Artists and Animators	15,924	97.3
27-1021.00	Commercial and Industrial Designers	13,601	98.0
27-1022.00	Fashion Designers	11,189	97.3
27-1026.00	Merchandise Displayers and Window Trimmers	14,632	97.2
27-1027.00	Set and Exhibit Designers	12,146	99.3
27-2011.00	Actors	13,348	98.6
27-2012.03	Program Directors	13,191	99.2
27-2012.04	Talent Directors	13,075	98.7
27-2021.00	Athletes and Sports Competitors	10,742	98.8
27-2031.00	Dancers	16,035	98.2
27-2041.01	Music Directors	13,186	98.2
27-2041.02	Music Composers and Arrangers	11,824	98.4
27-2042.01	Singers	8,031	98.4
27-2042.02	Musicians, Instrumental	8,975	97.8
27-3012.00	Public Address System and Other Announcers	12,102	98.2
27-3021.00	Broadcast News Analysts	8,079	99.4
27-3091.00	Interpreters and Translators	12,148	98.1
27-4014.00	Sound Engineering Technicians	10,490	98.9
27-4021.00	Photographers	15,143	98.7
29-1011.00	Chiropractors	17,376	99.0
29-1021.00	Dentists, General	10,202	96.2
29-1022.00	Oral and Maxillofacial Surgeons	8,984	99.0

continued

Exhibit H-12. Item response Rates by Occupation (continued)

SOC	SOC Title	Questions	Response Rate (%)
29-1023.00	Orthodontists	7,979	98.4
29-1024.00	Prosthodontists	9,126	98.5
29-1061.00	Anesthesiologists	18,157	98.7
29-1062.00	Family and General Practitioners	11,929	97.6
29-1063.00	Internists, General	13,224	98.3
29-1064.00	Obstetricians and Gynecologists	16,976	98.0
29-1065.00	Pediatricians, General	21,921	98.2
29-1067.00	Surgeons	18,716	98.4
29-1081.00	Podiatrists	9,654	98.2
29-1121.00	Audiologists	27,523	99.1
29-2053.00	Psychiatric Technicians	8,210	96.1
31-2012.00	Occupational Therapist Aides	8,540	98.5
31-9011.00	Massage Therapists	10,505	97.7
31-9094.00	Medical Transcriptionists	18,370	98.4
33-1011.00	First-Line Supervisors/Managers of Correctional Officers	19,112	98.6
33-1021.02	Forest Fire Fighting and Prevention Supervisors	16,770	97.6
33-2021.02	Fire Investigators	11,789	99.1
33-2022.00	Forest Fire Inspectors and Prevention Specialists	9,744	98.7
33-3021.03	Criminal Investigators and Special Agents	12,466	98.1
33-3021.05	Immigration and Customs Inspectors	22,089	98.5
33-3041.00	Parking Enforcement Workers	12,412	97.4
33-3051.03	Sheriffs and Deputy Sheriffs	11,964	98.6
33-3052.00	Transit and Railroad Police	8,965	98.2
33-9011.00	Animal Control Workers	10,651	97.4
33-9021.00	Private Detectives and Investigators	17,848	98.8
33-9091.00	Crossing Guards	10,652	96.2
35-1011.00	Chefs and Head Cooks	13,731	97.7
35-2012.00	Cooks, Institution and Cafeteria	13,746	95.2
35-3041.00	Food Servers, Nonrestaurant	12,323	95.8
35-9011.00	Dining Room and Cafeteria Attendants and Bartender Helpers	13,469	96.7
35-9021.00	Dishwashers	13,258	93.8
37-1011.00	First-Line Supervisors/Managers of Housekeeping and Janitorial Workers	17,724	96.8
37-1012.00	First-Line Supervisors/Managers of Landscaping, Lawn Service, and Groundskeeping Workers	23,727	97.6
37-2011.00	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	19,636	95.9
37-2012.00	Maids and Housekeeping Cleaners	15,816	93.5
37-2021.00	Pest Control Workers	11,340	97.2
37-3011.00	Landscaping and Groundskeeping Workers	31,220	96.8
37-3012.00	Pesticide Handlers, Sprayers, and Applicators, Vegetation	18,246	97.7

continued)

Exhibit H-12. Item response Rates by Occupation (continued)

SOC	SOC Title	Questions	Response Rate (%)
37-3013.00	Tree Trimmers and Pruners	22,649	97.4
39-1021.00	First-Line Supervisors/Managers of Personal Service Workers	11,416	98.2
39-2011.00	Animal Trainers	12,696	98.5
39-3012.00	Gaming and Sports Book Writers and Runners	10,297	97.2
39-3021.00	Motion Picture Projectionists	17,023	98.7
39-3092.00	Costume Attendants	9,095	97.0
39-5011.00	Barbers	18,917	96.0
39-5092.00	Manicurists and Pedicurists	10,180	97.8
39-5094.00	Skin Care Specialists	20,563	97.7
39-6022.00	Travel Guides	8,166	98.0
39-6031.00	Flight Attendants	24,883	98.4
39-6032.00	Transportation Attendants, Except Flight Attendants and Baggage Porters	13,100	96.3
39-9041.00	Residential Advisors	26,434	98.9
41-1012.00	First-Line Supervisors/Managers of Non-Retail Sales Workers	13,878	98.4
41-2012.00	Gaming Change Persons and Booth Cashiers	8,431	96.6
41-3031.01	Sales Agents, Securities and Commodities	11,626	98.3
41-3031.02	Sales Agents, Financial Services	8,204	99.3
41-4011.00	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	15,949	98.1
41-4012.00	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	17,165	98.5
41-9011.00	Demonstrators and Product Promoters	11,828	97.7
41-9012.00	Models	7,980	98.4
41-9031.00	Sales Engineers	11,978	98.9
43-1011.00	First-Line Supervisors/Managers of Office and Administrative Support Workers	87,724	98.7
43-2021.00	Telephone Operators	11,199	96.9
43-3021.01	Statement Clerks	8,294	97.6
43-4011.00	Brokerage Clerks	6,640	97.9
43-4021.00	Correspondence Clerks	8,951	97.9
43-4031.03	License Clerks	16,006	95.7
43-4041.01	Credit Authorizers	6,594	98.5
43-4041.02	Credit Checkers	7,035	97.8
43-4061.00	Eligibility Interviewers, Government Programs	12,010	98.1
43-4131.00	Loan Interviewers and Clerks	23,818	98.0
43-4181.00	Reservation and Transportation Ticket Agents and Travel Clerks	9,257	97.5
43-5011.00	Cargo and Freight Agents	12,872	98.9
43-5021.00	Couriers and Messengers	15,938	95.6
43-5041.00	Meter Readers, Utilities	14,003	98.3

continued

Exhibit H-12. Item response Rates by Occupation (continued)

SOC	SOC Title	Questions	Response Rate (%)
43-5051.00	Postal Service Clerks	21,139	97.6
43-5052.00	Postal Service Mail Carriers	20,536	97.9
43-5053.00	Postal Service Mail Sorters, Processors, and Processing Machine Operators	7,927	96.9
43-5061.00	Production, Planning, and Expediting Clerks	22,498	98.3
43-5081.02	Marking Clerks	6,399	96.1
43-5111.00	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	12,835	96.3
43-9021.00	Data Entry Keyers	13,613	97.4
43-9041.01	Insurance Claims Clerks	11,620	96.2
43-9051.00	Mail Clerks and Mail Machine Operators, Except Postal Service	19,313	96.0
43-9071.00	Office Machine Operators, Except Computer	15,961	97.5
43-9111.00	Statistical Assistants	9,566	98.7
45-1011.01	First-Line Supervisors and Manager/Supervisors - Agricultural Crop and Horticultural Workers	16,108	98.6
45-1011.02	First-Line Supervisors and Manager/Supervisors - Animal Husbandry and Animal Care Workers	13,390	97.7
45-1011.05	First-Line Supervisors and Manager/Supervisors - Logging Workers	10,754	97.8
45-2021.00	Animal Breeders	9,825	98.1
45-2041.00	Graders and Sorters, Agricultural Products	11,070	94.7
45-2091.00	Agricultural Equipment Operators	14,982	95.9
45-2092.01	Nursery Workers	13,019	95.2
45-2092.02	Farm Workers, Crop	10,828	94.6
45-2093.00	Farmworkers, Farm and Ranch Animals	12,687	95.6
45-3011.00	Fishers and Related Fishing Workers	18,814	97.1
45-4011.00	Forest and Conservation Workers	19,370	97.3
45-4021.00	Fallers	9,245	98.0
45-4022.00	Logging Equipment Operators	9,545	96.7
45-4023.00	Log Graders and Scalers	7,819	96.7
47-1011.00	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	20,756	98.6
47-2011.00	Boilermakers	16,299	98.1
47-2022.00	Stonemasons	11,995	97.0
47-2042.00	Floor Layers, Except Carpet, Wood, and Hard Tiles	9,784	98.1
47-2051.00	Cement Masons and Concrete Finishers	11,416	97.5
47-2053.00	Terrazzo Workers and Finishers	24,404	97.7
47-2061.00	Construction Laborers	16,606	97.2
47-2073.00	Operating Engineers and Other Construction Equipment Operators	22,540	97.6
47-2081.00	Drywall and Ceiling Tile Installers	17,739	96.9
47-2082.00	Tapers	13,109	97.5

continued

Exhibit H-12. Item response Rates by Occupation (continued)

SOC	SOC Title	Questions	Response Rate (%)
47-2121.00	Glaziers	10,404	97.3
47-2131.00	Insulation Workers, Floor, Ceiling, and Wall	9,929	96.3
47-2132.00	Insulation Workers, Mechanical	15,282	97.3
47-2141.00	Painters, Construction and Maintenance	14,449	96.8
47-2151.00	Pipelayers	11,730	97.9
47-2161.00	Plasterers and Stucco Masons	13,372	97.2
47-2171.00	Reinforcing Iron and Rebar Workers	11,167	96.7
47-2181.00	Roofers	15,506	96.8
47-2221.00	Structural Iron and Steel Workers	13,101	97.0
47-3011.00	Helpers—Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	10,901	96.0
47-3012.00	Helpers—Carpenters	11,576	97.7
47-3014.00	Helpers—Painters, Paperhangers, Plasterers, and Stucco Masons	12,535	95.8
47-4021.00	Elevator Installers and Repairers	11,506	97.3
47-4031.00	Fence Erectors	14,492	96.5
47-4041.00	Hazardous Materials Removal Workers	9,956	97.3
47-4061.00	Rail-Track Laying and Maintenance Equipment Operators	22,614	96.5
47-4071.00	Septic Tank Servicers and Sewer Pipe Cleaners	14,957	96.3
47-4091.00	Segmental Pavers	8,787	97.7
47-5011.00	Derrick Operators, Oil and Gas	10,025	96.0
47-5012.00	Rotary Drill Operators, Oil and Gas	14,650	97.9
47-5013.00	Service Unit Operators, Oil, Gas, and Mining	22,105	97.8
47-5021.00	Earth Drillers, Except Oil and Gas	11,820	96.9
47-5042.00	Mine Cutting and Channeling Machine Operators	9,078	95.5
47-5071.00	Roustabouts, Oil and Gas	13,400	97.9
47-5081.00	Helpers—Extraction Workers	10,970	97.6
49-2011.00	Computer, Automated Teller, and Office Machine Repairers	18,358	98.6
49-2021.00	Radio Mechanics	11,174	97.9
49-2022.00	Telecommunications Equipment Installers and Repairers, Except Line Installers	29,167	98.2
49-2091.00	Avionics Technicians	8,359	98.7
49-2092.00	Electric Motor, Power Tool, and Related Repairers	25,412	97.1
49-2093.00	Electrical and Electronics Installers and Repairers, Transportation Equipment	9,190	98.3
49-2095.00	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	15,701	97.5
49-2096.00	Electronic Equipment Installers and Repairers, Motor Vehicles	14,452	98.2
49-2097.00	Electronic Home Entertainment Equipment Installers and Repairers	12,298	98.3
49-2098.00	Security and Fire Alarm Systems Installers	19,142	98.6

continued

Exhibit H-12. Item response Rates by Occupation (continued)

SOC	SOC Title	Questions	Response Rate (%)
49-3011.00	Aircraft Mechanics and Service Technicians	14,812	98.9
49-3022.00	Automotive Glass Installers and Repairers	13,069	98.0
49-3023.02	Automotive Specialty Technicians	10,861	98.4
49-3041.00	Farm Equipment Mechanics	14,674	97.8
49-3043.00	Rail Car Repairers	8,995	95.7
49-3051.00	Motorboat Mechanics	21,381	98.0
49-3052.00	Motorcycle Mechanics	12,337	97.0
49-3053.00	Outdoor Power Equipment and Other Small Engine Mechanics	13,930	98.1
49-3093.00	Tire Repairers and Changers	12,663	95.8
49-9011.00	Mechanical Door Repairers	16,841	98.7
49-9012.00	Control and Valve Installers and Repairers, Except Mechanical Door	24,764	97.6
49-9031.00	Home Appliance Repairers	12,080	98.6
49-9041.00	Industrial Machinery Mechanics	25,656	98.4
49-9043.00	Maintenance Workers, Machinery	28,775	98.1
49-9045.00	Refractory Materials Repairers, Except Brickmasons	10,350	96.2
49-9051.00	Electrical Power-Line Installers and Repairers	14,040	97.3
49-9052.00	Telecommunications Line Installers and Repairers	22,844	98.3
49-9061.00	Camera and Photographic Equipment Repairers	24,583	98.2
49-9091.00	Coin, Vending, and Amusement Machine Servicers and Repairers	17,691	96.8
49-9092.00	Commercial Divers	14,417	98.4
49-9094.00	Locksmiths and Safe Repairers	9,591	96.4
49-9095.00	Manufactured Building and Mobile Home Installers	7,109	98.0
49-9096.00	Riggers	14,993	97.4
49-9097.00	Signal and Track Switch Repairers	13,667	98.0
51-1011.00	First-Line Supervisors/Managers of Production and Operating Workers	102,534	98.3
51-2011.00	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	10,711	97.9
51-2021.00	Coil Winders, Tapers, and Finishers	8,941	96.8
51-2022.00	Electrical and Electronic Equipment Assemblers	8,284	95.2
51-2023.00	Electromechanical Equipment Assemblers	15,714	97.6
51-2031.00	Engine and Other Machine Assemblers	15,898	98.0
51-2041.00	Structural Metal Fabricators and Fitters	11,564	96.5
51-2091.00	Fiberglass Laminators and Fabricators	14,622	96.2
51-2092.00	Team Assemblers	24,188	97.7
51-3011.00	Bakers	15,694	97.6
51-3021.00	Butchers and Meat Cutters	12,906	96.1
51-3022.00	Meat, Poultry, and Fish Cutters and Trimmers	8,660	94.7
51-3023.00	Slaughterers and Meat Packers	9,879	96.9

continued

Exhibit H-12. Item response Rates by Occupation (continued)

SOC	SOC Title	Questions	Response Rate (%)
51-3091.00	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	9,081	97.6
51-4011.00	Computer-Controlled Machine Tool Operators, Metal and Plastic	17,180	98.5
51-4012.00	Numerical Tool and Process Control Programmers	11,980	98.1
51-4021.00	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	13,409	96.7
51-4022.00	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	10,416	96.8
51-4023.00	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	12,308	97.2
51-4031.00	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	34,653	96.6
51-4032.00	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	10,246	97.0
51-4033.00	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	10,762	97.3
51-4034.00	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	17,105	98.2
51-4035.00	Milling and Planning Machine Setters, Operators, and Tenders, Metal and Plastic	13,992	98.0
51-4051.00	Metal-Refining Furnace Operators and Tenders	9,710	96.2
51-4052.00	Pourers and Casters, Metal	11,297	96.0
51-4061.00	Model Makers, Metal and Plastic	21,207	98.5
51-4062.00	Patternmakers, Metal and Plastic	16,901	98.3
51-4071.00	Foundry Mold and Coremakers	9,086	97.4
51-4072.00	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	17,051	96.3
51-4081.00	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	16,669	98.1
51-4111.00	Tool and Die Makers	12,351	98.8
51-4121.01	Welders, Cutters, and Welder Fitters	26,281	97.7
51-4121.07	Solderers and Brazers	10,443	97.9
51-4122.00	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	18,252	97.3
51-4191.00	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	9,921	98.1
51-4192.00	Lay-Out Workers, Metal and Plastic	8,921	98.7
51-4193.00	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	15,061	96.4
51-4194.00	Tool Grinders, Filers, and Sharpeners	15,767	98.2
51-5011.00	Bindery Workers	18,789	98.0
51-5012.00	Bookbinders	9,337	98.7
51-5021.00	Job Printers	11,672	98.1

continued

Exhibit H-12. Item response Rates by Occupation (continued)

SOC	SOC Title	Questions	Response Rate (%)
51-5022.00	Prepress Technicians and Workers	24,661	97.5
51-5023.00	Printing Machine Operators	26,796	98.0
51-6011.00	Laundry and Dry-Cleaning Workers	11,026	95.0
51-6021.00	Pressers, Textile, Garment, and Related Materials	12,524	92.9
51-6031.00	Sewing Machine Operators	19,622	92.4
51-6041.00	Shoe and Leather Workers and Repairers	18,636	96.7
51-6042.00	Shoe Machine Operators and Tenders	10,727	95.9
51-6052.00	Tailors, Dressmakers, and Custom Sewers	12,459	96.6
51-6061.00	Textile Bleaching and Dyeing Machine Operators and Tenders	17,359	95.4
51-6062.00	Textile Cutting Machine Setters, Operators, and Tenders	14,773	94.2
51-6063.00	Textile Knitting and Weaving Machine Setters, Operators, and Tenders	11,460	93.3
51-6064.00	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	17,914	95.0
51-6091.00	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers	9,904	97.9
51-6092.00	Fabric and Apparel Patternmakers	10,991	97.9
51-6093.00	Upholsterers	15,722	96.4
51-7011.00	Cabinetmakers and Bench Carpenters	15,642	96.3
51-7021.00	Furniture Finishers	14,262	94.2
51-7031.00	Model Makers, Wood	8,313	97.5
51-7032.00	Patternmakers, Wood	12,851	98.6
51-7041.00	Sawing Machine Setters, Operators, and Tenders, Wood	23,744	95.8
51-7042.00	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	25,573	97.0
51-8011.00	Nuclear Power Reactor Operators	13,833	99.3
51-8012.00	Power Distributors and Dispatchers	14,034	99.1
51-8013.00	Power Plant Operators	11,205	98.4
51-8021.00	Stationary Engineers and Boiler Operators	13,262	97.8
51-8091.00	Chemical Plant and System Operators	17,141	98.2
51-8092.00	Gas Plant Operators	12,097	97.6
51-8093.00	Petroleum Pump System Operators, Refinery Operators, and Gaugers	13,079	98.5
51-9011.00	Chemical Equipment Operators and Tenders	12,753	97.6
51-9012.00	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	16,968	98.6
51-9021.00	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	17,771	98.3
51-9022.00	Grinding and Polishing Workers, Hand	13,639	95.5
51-9023.00	Mixing and Blending Machine Setters, Operators, and Tenders	24,017	98.0
51-9031.00	Cutters and Trimmers, Hand	13,844	95.7

continued

Exhibit H-12. Item response Rates by Occupation (continued)

SOC	SOC Title	Questions	Response Rate (%)
51-9032.00	Cutting and Slicing Machine Setters, Operators, and Tenders	25,819	95.5
51-9041.00	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	12,623	97.6
51-9061.00	Inspectors, Testers, Sorters, Samplers, and Weighers	33,381	97.2
51-9081.00	Dental Laboratory Technicians	16,476	97.2
51-9082.00	Medical Appliance Technicians	18,097	98.7
51-9083.00	Ophthalmic Laboratory Technicians	8,215	97.4
51-9121.00	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	14,591	96.9
51-9122.00	Painters, Transportation Equipment	18,565	97.6
51-9123.00	Painting, Coating, and Decorating Workers	13,726	97.6
51-9131.00	Photographic Process Workers	20,890	98.2
51-9132.00	Photographic Processing Machine Operators	13,978	97.8
51-9141.00	Semiconductor Processors	11,903	96.6
51-9191.00	Cementing and Gluing Machine Operators and Tenders	13,146	97.3
51-9192.00	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	7,657	96.0
51-9193.00	Cooling and Freezing Equipment Operators and Tenders	13,247	97.0
51-9194.00	Etchers and Engravers	11,860	96.7
51-9195.04	Glass Blowers, Molders, Benders, and Finishers	13,737	97.9
51-9195.07	Molding and Casting Workers	17,443	97.3
51-9196.00	Paper Goods Machine Setters, Operators, and Tenders	10,809	97.9
51-9197.00	Tire Builders	9,177	95.6
51-9198.00	Helpers—Production Workers	21,194	96.6
53-1011.00	Aircraft Cargo Handling Supervisors	8,061	98.2
53-1021.00	First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand	22,587	98.8
53-1031.00	First-Line Supervisors/Managers of Transportation and Material-Moving Machine and Vehicle Operators	13,427	98.1
53-2011.00	Airline Pilots, Copilots, and Flight Engineers	29,714	98.7
53-2012.00	Commercial Pilots	15,682	98.1
53-2021.00	Air Traffic Controllers	14,293	98.3
53-2022.00	Airfield Operations Specialists	8,887	98.8
53-3011.00	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	10,689	98.4
53-3022.00	Bus Drivers, School	28,434	97.2
53-3032.00	Truck Drivers, Heavy and Tractor-Trailer	26,071	96.8
53-3033.00	Truck Drivers, Light or Delivery Services	10,293	98.1
53-4011.00	Locomotive Engineers	11,471	97.5
53-4013.00	Rail Yard Engineers, Dinkey Operators, and Hostlers	13,604	96.8
53-4021.00	Railroad Brake, Signal, and Switch Operators	16,584	98.3

continued

Exhibit H-12. Item response Rates by Occupation (continued)

SOC	SOC Title	Questions	Response Rate (%)
53-4031.00	Railroad Conductors and Yardmasters	12,692	99.0
53-4041.00	Subway and Streetcar Operators	21,987	97.2
53-5011.00	Sailors and Marine Oilers	13,016	96.4
53-5021.01	Ship and Boat Captains	22,678	97.9
53-5021.02	Mates- Ship, Boat, and Barge	15,579	98.1
53-5021.03	Pilots, Ship	16,739	98.1
53-5022.00	Motorboat Operators	12,223	98.5
53-5031.00	Ship Engineers	15,671	97.2
53-6031.00	Service Station Attendants	10,724	96.5
53-6041.00	Traffic Technicians	17,906	98.1
53-6051.01	Aviation Inspectors	9,318	98.4
53-6051.02	Transportation Vehicle and Equipment Inspectors, Except Aviation	13,441	97.4
53-7011.00	Conveyor Operators and Tenders	12,644	96.6
53-7021.00	Crane and Tower Operators	9,361	96.9
53-7032.00	Excavating and Loading Machine and Dragline Operators	17,426	98.3
53-7062.00	Laborers and Freight, Stock, and Material Movers, Hand	31,770	96.4
53-7063.00	Machine Feeders and Offbearers	21,509	97.5
53-7071.00	Gas Compressor and Gas Pumping Station Operators	13,959	97.9
53-7072.00	Pump Operators, Except Wellhead Pumpers	12,659	96.8
53-7081.00	Refuse and Recyclable Material Collectors	15,045	97.7
53-7121.00	Tank Car, Truck, and Ship Loaders	7,920	97.9

References for Appendix H

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