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# Appendix I: Nonresponse Analysis

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Nonresponse in the O\*NET Data Collection Program can occur from any of three sources. Establishments can cause nonresponse when a business fails to participate at the verification, screening, recruiting, or sampling stage of selection. This type of nonresponse is referred to as *establishment nonresponse*. A second type of nonresponse, referred to as *employee nonresponse*, occurs at the employee level when a selected employee fails to complete and return a questionnaire. 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 here.

The data analyzed here come from the Establishment Method data included in Analysis Cycles 19-21.<sup>1</sup> Data from the Occupation Expert (OE) Method do not lend themselves to this type of analysis: OE Method respondents are not sampled through establishments and are often volunteer respondents not related to a target population from which bias can be measured.

## I.1 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 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 equation

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

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<sup>1</sup> A total of 21 analysis cycles have been completed through June 2020. An analysis of nonresponse in Analysis Cycles 1–3 was included in the September 2005 Office of Management and Budget submission (Appendix E); an analysis of nonresponse in Cycles 4–8 was included in the December 2008 Office of Management and Budget submission (Appendix H); an analysis of nonresponse in Cycles 9–12 was included in the April 2012 Office of Management and Budget submission (Appendix E); an analysis of nonresponse in Cycles 13–15 was included in the August 2015 Office of Management and Budget submission (Appendix E); and an analysis of nonresponse in Cycles 16–18 was included in the August 2018 Office of Management and Budget submission (Appendix D).

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  $\bar{X}_N$  increases. Substituting Equation (1) into Equation (2) gives

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

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 those for nonrespondents. If either or both components are small, then the bias should also be small. If important biases occur, usually a substantial proportion of nonrespondents ( $p_N$ ) exists 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 any such data existed, they would be on respondents. Thus, to obtain surrogates for the primary outcome variables, it is necessary to turn to other variables, those 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 evince 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 work activities, work context, or knowledge 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, and 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 on the basis of observed values (Little & Rubin, 1987). The O\*NET Data Collection Program incorporates weighting as one method for protecting against the influence of nonresponse bias.<sup>2</sup>

## I.2 Establishment Nonresponse

Appendix Exhibit I-1 displays the establishment eligibility and response rates for Analysis Cycles 19–21 by stage of data collection; Appendix Exhibit I-2 compares the distribution of respondents and nonrespondents across various establishment attributes. (All exhibits are at the end of this appendix.) The analysis population of establishments includes any establishment that had at least one of its assigned occupations published in Analysis Cycles 19–21, whether or not any of the occupations were eventually selected from that establishment.<sup>3</sup> The rates and distributions are presented separately by various variables to allow examination of the possibility of nonresponse bias. These variables were selected because they were available for both respondents and nonrespondents and, on the basis of logistic regression modeling results of establishment-level response propensity, they were likely to be related to the primary outcome variables of the O\*NET Program.

The following describes the major row headings in Appendix Exhibits I-1 and I-2:

- *Census Division* is assigned according to the address of the establishment.
- *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.
- *NAICS Sector* is the North American Industry Classification System of the establishment.
- *Number of Occupations on Establishment Sampling List* is the number of occupations 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.

### I.2.1 Establishment Final Unweighted Response Rates

Appendix Exhibit I-1 displays the establishment eligibility and response rates for Analysis Cycles 19–21 by stage of data collection.

The following describes the Appendix Exhibit I-1 column headings:

- *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 the computation of rates. For example, screening rates reflect only

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<sup>2</sup> For a discussion of weighting, see Section B.1.1 in Part B of the Supporting Statement.

<sup>3</sup> Establishments that had employee sampling suspended for all assigned occupations are not included in the establishment nonresponse analysis. See Section B.1.1 for a description of these procedures.

establishments that responded at the verification stage. Final rates are combined rates across all stages of data collection. All establishments were considered to be eligible at the verification stage. At subsequent stages, nonrespondents from the previous stage were removed from the denominator of the eligibility rate; therefore, the final eligibility rate, defined as the total number of eligible establishments divided by the total establishments in the sample, is not equivalent to the product of the eligibility rates at each stage. Similarly, establishments that were identified as ineligible in the previous stage were not included in the denominator of the response rate for a particular stage. Thus, the final response rate, defined as the total number of responding establishments divided by the total number of eligible establishments in the sample, is not the product of the response rates at each stage.

- **Elig** is the percentage of establishments that were considered eligible. Establishments are considered survey eligible if they are classified as (1) at the same street address or building as in the sampling frame, (2) in business (permanently or temporarily), (3) able to be located, and (4) not a duplicate.
- **Resp** is the percentage of eligible establishments that were considered respondents; that is, they did not refuse to participate in the study. This includes participating establishments where none of the target occupations were present.

The data in Appendix Exhibit I-1 reveal that the final unweighted response rate for establishments was 65.0%. The final eligibility rate was 78.5%.<sup>4</sup> The data also indicate that response rates varied for the four data collection stages, with the lowest response rate occurring at the recruiting stage (79.8%) and the lowest eligibility rate occurring at the verification stage (82.0%). These results are intuitive for the following reasons:

- Typically, it is not until the recruiting stage of data collection that the POC realized the burden involved in participation. Consequently, it is expected that most nonresponse would occur at this stage.
- The lowest eligibility rate is expected at the verification stage, when each establishment is first contacted and when establishments that closed or moved their businesses are first identified.

Using frame information, one can compare the respondents and nonrespondents across various attributes to approximate nonresponse bias. An estimate of the first source of nonresponse bias can be found in Appendix Exhibit I-1 under the column headed *Final Resp*. As mentioned above, low response rates indicate possible nonresponse bias. RTI assessed the response rate for each level of a specific attribute against the overall value to determine whether the difference was significant. This assessment was conducted separately for each stage of data collection. Differences statistically significant at the 0.05 level are indicated with an asterisk (\*).<sup>5</sup>

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

<sup>5</sup> The tests were conditioned on the overall rates because the objective was to identify any subgroups that differed from the observed overall rate.

**Census Division.** Establishments in the West North Central region (70.1%) had the highest significant final response rate, whereas the Middle Atlantic region (61.7%) had the lowest significant final response rate.

**Total Employees in Establishment.** For establishments with 5 to 1,000+ employees, a general decreasing trend appears in the final response rates as the size of the establishment increases. This pattern suggests that the perceived burden on the POCs in smaller establishments may have been lower than the perceived burden on the POCs in larger establishments. In addition, in larger organizations, participation may not be at the discretion of the POC but instead may require corporate approval. This observation is consistent with those in other literature (e.g., Willimack, Nichols, & Sudman, 2002).

**SIC Division.** Comparing the response rates of the different SIC divisions with the overall final response rate, one sees that Public Administration (78.5%) had a significantly higher final response rate, whereas the Finance, Insurance, Real Estate (48.4%) industry had the lowest significant final response rate.<sup>6</sup>

**NAICS Sector.** Comparing the response rates of the different NAICS sectors to the overall final response rate, one sees that Public Administration (78.5%) had the highest significant final response rate, and Finance and Insurance (47.6%) had the lowest significant final response rate.<sup>6</sup>

**Number of Occupations on Establishment Sampling List.** The final response rate for establishments with 1–5 occupations on the sampling list was significantly higher than the overall final response rate (69.2%, as opposed to 65.0%), and establishments with 9 occupations on the sampling list had the lowest significant final response rate (48.7%).

**Time Zone.** Establishments in the Alaska Standard Time zone had the highest significant final response rate (78.2%). Establishments in the Pacific Standard Time zone had a significantly lower final response rate (62.0%).

**Metropolitan Status.** Rural establishments had a final response rate significantly higher than the overall response rate (71.8% vs 65.0%), whereas urban establishments had a significantly lower final response rate (63.3%).

## I.2.2 Comparison of Establishment Respondents and Nonrespondents

Appendix Exhibit I-2 shows a comparison of the distribution of respondents and the distribution of nonrespondents across various establishment attributes. The column showing *Percent Difference (Resp vs. Nonresp)* gives an estimate of the second component of the nonresponse bias formula (Equation [4]). An estimate of the nonresponse bias across an attribute (see Equation [2]) is shown under the final column, *Percent Difference (Resp vs. Overall)*. As discussed above, a potential source of nonresponse bias occurs when this difference becomes large. Differences in the final column marked with an asterisk

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<sup>6</sup> Response rate patterns by SIC Division and NAICS Sector were highly dependent on the occupations included in a particular collection of occupations. These findings would not, therefore, necessarily apply to a different set of occupations in different analysis cycles.

are statistically different from zero at the 0.05 level. Large positive or negative values indicate possible nonresponse bias. Although numerous statistically significant differences exist, large sample sizes tend to increase the likelihood that very small differences will be statistically significant. In this situation, it is important to determine whether the differences are of sufficient magnitudes to be meaningful. For establishment nonresponse, the differences between respondents and the overall sample do not appear to be meaningful: 83.9% of the attributes had an absolute difference of less than 1 percentage point, 4.8% had an absolute difference of at least 1 but less than 2 percentage points, and 11.3% had an absolute difference of 2 or more percentage points (with a maximum difference of 4.8 percentage points).<sup>7</sup>

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 with those of the overall sample. The effect size,  $w$ , is calculated using the following formula:

$$w = \sqrt{\sum_{i=1}^m \frac{(p_{oi} - p_{1i})^2}{p_{oi}}}, \quad (5)$$

where  $m$  represents the number of categories (e.g., Census division),  $p_{oi}$  is the overall distribution, and  $p_{1i}$  represents the distribution among the respondents.

According to the guidelines suggested by Cohen, an effect size is classified 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 Appendix Exhibit I-2, all of the effect sizes were small, with the largest effect size being equal to 0.12 for NAICS Sector. These results suggest that the distribution of the variables for respondents and that for nonrespondents are quite similar (i.e.,  $\bar{X}_R - \bar{X}_N$  is small).

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

### **I.3 Employee Nonresponse**

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. In this way, potential sources of nonresponse bias can be approximated at the employee level.

Appendix Exhibit I-3 displays the unweighted response rates for employees; Appendix Exhibit I-4 compares the distribution of respondents and nonrespondents across various employee

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<sup>7</sup> Absolute difference is the absolute value of the final column of Exhibit D-2.

attributes from Establishment Method data collection for occupations published in Analysis Cycles 19–21.<sup>8</sup>

In addition to the categories displayed in Appendix Exhibits I-1 and I-2, Appendix Exhibits I-3 and I-4 also display response rates by the following employee-level characteristics (rows):

- **Total Selected Employees in Establishment** is the number of employees who were selected from the establishment. Note that this value ranges only from 1 to 20. This range reflects the rule that no more than 20 employees may be selected from any single establishment per 12-month period.
- **Questionnaire Type** is the type of questionnaire that the employee was selected to complete. There are three questionnaire types: Work Activities, Work Context, and Knowledge.
- **Occupation Class** is derived from the first two digits of the O\*NET occupation code.

The response rates are presented separately by the various row variables to reveal any possibility of nonresponse bias. These variables were selected because they were available for both respondents and nonrespondents and, on the basis of logistic modeling results of both establishment-level and employee-level response propensity, they were likely to be related to the primary outcome variables of the O\*NET Program.

### I.3.1 Employee Final Unweighted Response Rates

An estimate of the second source of nonresponse bias can be found in Appendix Exhibit I-3 under the column headed *Response Rate*. As discussed in Section I-1, low response rates may indicate nonresponse bias. RTI assessed the response rate for each level of a specific covariate against the overall value to determine whether the difference was significant. Differences statistically significant at the 0.05 level are indicated with an asterisk (\*).<sup>9</sup>

**Census Division.** Employees in the Mountain region had the highest significant response rate (61.2%), whereas employees in the Pacific region had the lowest significant response rate (53.6%). The overall response rate was 57.5%.

**Total Employees in Establishment.** The response rate for employees from establishments with 1–4 employees had the highest significant response rate (68.6%). The lowest significant response rate was for employees from establishments with 1,000+ employees (47.2%). The overall response rate was 57.5%.

**SIC Division.** Employees in the Mining industry had the highest significant response rate (63.8%). Employees from the Retail Trade industry had the lowest significant response rate (50.0%).

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<sup>8</sup> Unweighted rates were used because appropriate weights were not available for nonresponding employees.

<sup>9</sup> The tests were conditioned on the overall rates because the objective was to identify any subgroups that differed from the observed overall rate.

**NAICS Sector.** Employees in the Utilities sector had the highest significant response rate (71.1%).<sup>10</sup> Employees in the Accommodation and Food Services sector had the lowest significant response rate (46.8%).

**Total Selected Employees in Establishment.** The highest significant response rate was for employees from establishments with only 1 selected employee (68.8%). The lowest significant response rate was for employees from establishments with 19 employees selected (45.8%).

**Questionnaire Type.** The Work Context questionnaire had a significantly higher response rate (59.2%) than the overall response rate of 57.5%. The Work Activities questionnaire had a significantly lower response rate (56.0%).

**Number of Occupations on Establishment Sampling List.** The final response rate for establishments with 1–5 occupations on the sampling list was significantly higher than the overall final response rate (61.6%, as opposed to 57.5%), and establishments with 6 occupations on the sampling list had the lowest significant final response rate (47.3%).

**Occupation Class.** Farming, Fishing, and Forestry Occupations had the highest significant response rate (69.5%) compared to the overall response rate (57.5%). Building and Grounds Cleaning and Maintenance Occupations had the lowest significant response rate (44.2%).<sup>11</sup>

**Time Zone.** The response rate in the Mountain Standard Time zone (62.0%) was significantly higher than the overall response rate (57.5%). The response rate in the Pacific Standard Time zone (53.7%) was significantly lower than the overall response rate.

**Metropolitan Status.** The response rate for employees in a rural area was significantly higher than the overall response rate (61.3% and 57.5%, respectively), and the response rate for employees in an urban area was significantly lower (56.2%).

### I.3.2 Comparison of Employee Respondents and Nonrespondents

Appendix Exhibit I-4 presents a comparison of the distribution of respondents and nonrespondents across various employee attributes. The column *Percent Difference (Resp vs. Nonresp)* reveals an estimate of the second component of the nonresponse bias formula (see Equation [4]). The column *Percent Difference (Resp vs. Overall)* shows an estimate of the nonresponse bias across an attribute (see Equation [2]). As discussed above, a potential source of nonresponse bias occurs when this difference becomes large. *Resp vs. 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 numerous statistically significant differences exist, large sample sizes tend to increase the likelihood that very small differences will be statistically significant. In this situation, it is important to

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<sup>10</sup> The response rate for NAICS Sector Management of Companies and Enterprises was 80%, but because only five employees were sampled, this figure was not considered a reliable estimate.

<sup>11</sup> Because no Military Specific Occupations were included among the occupations in Analysis Cycles 19–21, the response rate of 0% is not applicable to this analysis.



determine whether 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; for example, 86.9% of the attributes had an absolute difference of less than 1 percentage point, 11.2% had an absolute difference of at least 1 but less than 2 percentage points, and 1.9% had an absolute difference of 2 or more percentage points.<sup>11</sup>

Another measure of potential nonresponse bias is the effect size, as defined by Cohen (1988). See Section D.2.2 for a full explanation. For the variables in Appendix Exhibit I-4, all of the effect sizes were small, with the largest effect size being equal to 0.10 for Total Selected Employees in Establishment. The combination of small absolute differences and very small effect sizes indicates a low likelihood of bias due to employee nonresponse.

## I.4 Item Nonresponse

Appendix Exhibits I-5 through I-11 display unweighted item response rates by item, item type, and occupation for Establishment Method data included in Analysis Cycles 19–21. These tables include questionnaire data from employee respondents in the occupations published in Analysis Cycles 19–21 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 nonrespondents in the employee nonresponse analysis in Section D.3.

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 unanswered).

**Work Activities, Work Context, and Knowledge.** The data in Appendix Exhibits I-5 through I-7 suggest that, for the Work Activities, Work Context, and Knowledge Questionnaires, little item nonresponse exists with respect to any single item on any questionnaire. The lowest response rate for any specific item in each questionnaire is 95.2% for Work Activities Questionnaire Item 22 (Level), 97.6% for Work Context Questionnaire Item 49, and 91.7% for Knowledge Questionnaire Item 8 (Level). In addition, as seen in Appendix Exhibit I-10, item nonresponse is slightly more prevalent for Level items than for Importance items, regardless of questionnaire type.

**Occupation-Specific Tasks.** It appears from Appendix Exhibit I-8 that item nonresponse may be more serious for certain Frequency and Importance items than for others and for some occupations more than others (e.g., 37-2012.00, Maids and Housekeeping Cleaners, accounted for 5 of the top 10 lowest item response rates). It should be noted, however, that the eligible sample size is small for these Frequency and Importance items because a responding employee is not required to respond to the corresponding Frequency and Importance item if he or she does not consider a task to be relevant.

**Background Questionnaire.** In Appendix Exhibit I-9, the item response rates appear to be nearly constant and high (nearly 94% or greater), with the exception of Item 4 (89.2%), which elicits information from the respondent about working in a family business.

*Item Type.* All the response rates by item type were 96.0% or higher (Appendix Exhibit I-10).

*Occupation.* Item response rates are provided in Appendix Exhibit I-11 for all occupations completed in Analysis Cycles 19–21. The overall item response rate was 97.9%, with the lowest response rate, 93.3%, coming from Maids and Housekeeping Cleaners (occupation code 37-2012.00). The highest response rate, 99.4%, came from Range Managers (occupation code 19-1031.02).

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

## **I.5 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 revealed that nonresponse patterns were somewhat related to essentially all variables considered in the analyses; however, when examined, the distribution of respondents and nonrespondents across various frame attributes showed that the overall potential for nonresponse bias at both the establishment and employee levels was 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.

**Appendix Exhibit I-1. Establishment Eligibility and Response Rates (Percent)**

Category	Total Estab	Verification		Screening		Recruiting		Sampling		Final	
		Elig	Resp	Elig	Resp	Elig	Resp	Elig	Resp	Elig	Resp
<b>Total</b>	50,808	82.0	96.9	96.9	88.1	99.4	79.8	100.0	95.9	78.5	65.0
<b>Census Division</b>											
New England	3,580	83.1	96.3	96.0*	87.7	99.3	80.5	100.0*	96.1	78.8	64.9
Middle Atlantic	8,625	81.1*	96.9	96.8	85.9*	99.2	78.0*	100.0*	95.7	77.4*	61.7*
East North Central	7,809	83.5*	96.9	97.2	88.4	99.4	80.1	100.0	96.6*	80.3*	65.9
West North Central	4,117	84.6*	96.8	97.2	91.7*	99.4	82.6*	100.0*	96.2	81.5*	70.1*
South Atlantic	7,509	80.8*	97.8*	97.1	88.9	99.4	81.0*	99.9	96.0	77.6	67.2*
East South Central	2,301	84.4*	97.7*	97.2	91.4*	99.3	78.8	100.0*	96.2	81.1*	67.5*
West South Central	4,669	81.5	97.6*	96.7	87.2	99.5	77.8*	100.0	93.8*	78.1	61.8*
Mountain	4,014	80.9	96.5	97.1	90.3*	99.4	80.5	100.0*	96.3	77.7	67.2*
Pacific	8,184	80.8*	96.3*	96.5	86.1*	99.4	79.5	100.0	95.9	77.0*	62.8*
<b>Total Employees in Establishment</b>											
Unknown	857	73.4*	97.1	97.2	90.9*	99.4	82.1	100.0*	96.1	70.7*	69.3*
1-4	7,537	62.7*	88.1*	93.6*	87.8	99.1	84.4*	100.0*	99.0*	58.4*	63.8
5-9	2,982	76.7*	94.0*	96.1	91.9*	99.6	86.3*	100.0*	98.8*	73.0*	73.1*
10-49	13,165	83.7*	97.7*	97.4*	90.1*	99.4	84.5*	100.0	97.4*	80.4*	72.0*
50-99	8,212	86.5*	98.5*	97.8*	87.9	99.5	79.3	100.0	96.1	83.8*	65.6
100-249	5,217	88.8*	98.7*	97.3	88.0	99.2	78.1*	100.0	94.3*	85.2*	63.6
250-499	7,767	87.3*	98.8*	97.1	86.5*	99.3	74.5*	100.0	92.8*	84.0*	58.9*
500-999	3,090	87.4*	98.7*	97.3	85.6*	99.3	70.1*	99.9	92.9*	84.2*	54.9*
1,000+	1,981	89.4*	98.9*	96.9	81.6*	99.3	72.0*	99.9	91.6*	85.8*	53.0*
<b>SIC Division</b>											
Agriculture, Forestry, Fishing	1,971	77.0*	94.4*	96.6	88.4	99.1	77.2*	100.0*	96.7	73.3*	61.7*
Mining	1,708	76.4*	95.2*	96.4	85.4*	99.6	83.9*	100.0*	97.2*	73.4*	66.0
Construction	2,536	82.1	95.5*	97.4	84.2*	99.7*	71.8*	99.9	94.4*	79.7	54.3*
Manufacturing	8,967	82.6	97.2	97.4*	86.3*	99.6*	79.6	100.0	94.8*	79.9*	63.0*
Transportation, Communication, Electric, Gas, and Sanitary Services	3,213	81.3	96.1*	96.8	86.2*	99.6*	81.7*	100.0*	96.3	77.7	64.5
Wholesale Trade	659	82.7	96.3	96.1	85.1	98.8	76.4	100.0*	97.1	78.2	60.3*
Retail Trade	2,645	83.7*	96.7	97.5	85.9*	99.5	73.5*	100.0*	94.0*	80.8*	57.0*
Finance, Insurance, Real Estate	1,808	83.8*	97.4	96.3	79.6*	99.7*	66.8*	100.0*	94.4	79.6	48.4*
Services	20,964	81.4	96.9	96.4*	88.9*	99.1*	79.9	100.0	96.2	77.3*	65.8
Public Administration	6,337	85.0*	99.0*	97.7*	94.4*	99.4	87.1*	100.0	96.7*	82.2*	78.5*

(continued)

**Appendix Exhibit I-1. Establishment Eligibility and Response Rates (Percent)  
(continued)**

Category	Total Estab	Verification		Screening		Recruiting		Sampling		Final	
		Elig	Resp	Elig	Resp	Elig	Resp	Elig	Resp	Elig	Resp
<b>NAICS Sector</b>											
Agriculture, Forestry, Fishing, and Hunting	1,447	75.4*	94.5*	95.8	91.5*	99.2	81.9	100.0*	97.1	71.5*	68.4*
Mining	1,667	76.4*	95.2*	96.3	85.2*	99.6	83.8*	100.0*	97.2*	73.3*	65.8
Utilities	528	83.9	96.4	94.8*	89.2	99.4	86.3*	100.0*	97.5	78.1	71.4*
Construction	2,577	82.0	95.5*	97.4	84.3*	99.7*	72.1*	99.9	94.4*	79.7	54.6*
Manufacturing	8,901	82.6	97.1	97.3	86.5*	99.6*	79.9	100.0	94.9*	79.8*	63.4*
Wholesale Trade	658	82.8	96.3	96.1	85.1	98.8	76.4	100.0*	97.1	78.3	60.3*
Retail Trade	1,468	82.9	97.3	97.6	87.8	99.6	75.1*	100.0*	95.8	80.3	61.2*
Transportation and Warehousing	1,828	80.4	95.6*	97.4	87.8	99.4	85.5*	100.0*	96.6	76.8	68.6*
Information	2,596	73.8*	92.1*	95.9*	85.9*	99.5	79.7	100.0*	97.1*	70.2*	60.7*
Finance and Insurance	1,735	84.0*	97.3	96.3	79.2*	99.7	66.4*	100.0*	93.9*	79.7	47.6*
Real Estate and Rental and Leasing	400	76.3*	98.4	95.8	87.3	99.6	75.0	100.0*	97.6	71.0*	62.1
Professional, Scientific, and Technical Services	2,340	79.4*	96.6	97.1	85.4*	99.3	79.8	100.0*	97.6*	75.7*	63.6
Management of Companies and Enterprises	20	70.0	92.9	100.0*	76.9	100.0*	80.0	100.0*	100.0*	70.0	57.1
Administrative and Support and Waste Management and Remediation Services	1,041	71.8*	93.3*	95.7	85.2*	99.6	76.8	99.7	94.6	66.6*	56.6*
Educational Services	5,487	85.8*	99.5*	96.8	91.6*	98.7*	82.4*	99.9	95.7	81.6*	71.6*
Health Care and Social Assistance	5,415	86.4*	98.4*	96.7	86.5*	99.6	77.5*	100.0*	97.0*	82.5*	63.5
Arts, Entertainment, and Recreation	2,742	73.4*	93.4*	95.6*	91.6*	99.1	80.8	100.0*	96.9*	69.3*	66.4
Accommodation and Food Services	1,939	88.6*	97.7*	97.7*	84.7*	99.4	69.8*	100.0*	89.3*	85.8*	51.2*
Other Services, Except Public Administration	1,625	80.0*	94.6*	95.9	87.8	98.9	75.4*	100.0*	96.4	75.8*	60.0*
Public Administration	6,394	85.0*	99.0*	97.7*	94.4*	99.4	87.1*	100.0	96.7*	82.2*	78.5*

(continued)

**Appendix Exhibit I-1. Establishment Eligibility and Response Rates (Percent)  
 (continued)**

Category	Total Estab	Verification		Screening		Recruiting		Sampling		Final	
		Elig	Resp	Elig	Resp	Elig	Resp	Elig	Resp	Elig	Resp
<b>Number of Occupations on Establishment Sampling List</b>											
1-5	38,499	80.3*	96.3*	96.7	89.2*	99.4	83.4*	100.0	97.3*	76.6*	69.2*
6	2,093	86.6*	98.3*	98.1*	82.5*	99.4	71.6*	100.0*	92.4*	84.5*	53.6*
7	1,584	87.7*	98.3*	97.6	86.3	99.2	71.6*	99.9	92.5*	84.9*	56.0*
8	1,286	87.1*	99.1*	98.4*	84.7*	99.3	68.9*	100.0*	93.7*	85.2*	54.1*
9	1,070	87.5*	98.8*	97.6	79.8*	99.4	68.2*	100.0*	90.8*	85.0*	48.7*
10	6,276	87.1*	99.3*	97.0	86.3*	99.0*	69.2*	100.0*	90.0*	83.8*	53.2*
<b>Time Zone</b>											
Eastern Standard Time	24,704	81.8	97.1	96.9	87.7	99.3	79.7	100.0	96.1	78.2	64.8
Central Standard Time	13,729	83.5*	97.2	97.1	89.1*	99.4	80.0	100.0	95.4	80.2*	65.7
Mountain Standard Time	3,705	80.9	96.5	97.3	91.3*	99.3	81.1	100.0*	96.5	77.9	68.6*
Pacific Standard Time	8,251	80.5*	96.3*	96.4	85.7*	99.4	79.1	100.0	95.7	76.6*	62.0*
Alaska Standard Time	194	90.7*	98.9*	96.5	93.9*	99.4	85.0	100.0*	99.2*	86.8*	78.2*
Hawaii Standard Time	225	84.0	97.9	98.3	88.0	100.0*	82.2	100.0*	96.8	81.9	68.4
<b>Metropolitan Status</b>											
Rural	9,634	85.0*	97.2	97.5*	92.5*	99.3	83.3*	100.0*	96.3	82.0*	71.8*
Urban	41,174	81.3*	96.9	96.7	87.0*	99.4	78.9*	100.0	95.8	77.7*	63.3*

Note: Response rates were calculated from those establishments that were classified as eligible at each step. Final rates are combined rates across all stages of data collection. For each stage, nonrespondents from the previous stage are removed from the denominator of the eligibility rate; therefore, the final eligibility rate, defined as the total number of eligible establishments divided by the total establishments in the sample, is not equivalent to the product of the eligibility rates at each stage. Similarly, establishments that were identified as ineligible in the previous stage were not included in the denominator of the response rate for a particular stage. Consequently, the final response rate, defined as the total number of responding establishments divided by the total number of eligible establishments in the sample, is not the product of the response rates at each stage. Statistical tests were conducted only for categories with two or more establishments. SIC = Standard Industrial Classification. NAICS = North American Industry Classification System. Beginning in 2017, RTI no longer samples under the category of 5,000 or more Total Employees in an Establishment. The category of 1,000-4,999 employees and 5,000 or more employees has been collapsed to 1,000+ to reflect the updated employee categories provided by Dun and Bradstreet, the frame vendor.

SIC = Standard Industrial Classification. NAICS = North American Industry Classification System.

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

**Appendix Exhibit I-2. Comparison of Establishment Respondents and Nonrespondents**

Category	Respondents		Nonrespondents		Overall		Percent Difference Resp vs. Nonresp	Percent Difference Resp vs. Overall
	No.	%	No.	%	No.	%		
<b>Total</b>	25,161	100.0	13,565	100.0	38,726	100.0	N/A	N/A
<b>Census Division (effect size = 0.04)</b>								
New England	1,766	7.0	956	7.0	2,722	7.0	-0.0	-0.0
Middle Atlantic	3,995	15.9	2,482	18.3	6,477	16.7	-2.4	-0.8*
East North Central	3,995	15.9	2,070	15.3	6,065	15.7	0.6	0.2
West North Central	2,282	9.1	972	7.2	3,254	8.4	1.9	0.7*
South Atlantic	3,818	15.2	1,863	13.7	5,681	14.7	1.4	0.5
East South Central	1,225	4.9	590	4.3	1,815	4.7	0.5	0.2
West South Central	2,203	8.8	1,360	10.0	3,563	9.2	-1.3	-0.4
Mountain	2,047	8.1	1,000	7.4	3,047	7.9	0.8	0.3
Pacific	3,830	15.2	2,272	16.7	6,102	15.8	-1.5	-0.5
<b>Total Employees in Establishment (effect size = 0.09)</b>								
Unknown	414	1.6	183	1.3	597	1.5	0.3	0.1
1-4	2,772	11.0	1,575	11.6	4,347	11.2	-0.6	-0.2
5-9	1,550	6.2	570	4.2	2,120	5.5	2.0	0.7*
10-49	7,320	29.1	2,850	21.0	10,170	26.3	8.1	2.8*
50-99	4,369	17.4	2,286	16.9	6,655	17.2	0.5	0.2
100-249	2,712	10.8	1,553	11.4	4,265	11.0	-0.7	-0.2
250-499	3,755	14.9	2,624	19.3	6,379	16.5	-4.4	-1.5*
500-999	1,392	5.5	1,145	8.4	2,537	6.6	-2.9	-1.0*
1,000+	877	3.5	779	5.7	1,656	4.3	-2.3	-0.8*
<b>SIC Division (effect size = 0.10)</b>								
Agriculture, Forestry, Fishing	870	3.5	539	4.0	1,409	3.6	-0.5	-0.2
Mining	825	3.3	425	3.1	1,250	3.2	0.1	0.1
Construction	1,093	4.3	919	6.8	2,012	5.2	-2.4	-0.9*
Manufacturing	4,448	17.7	2,609	19.2	7,057	18.2	-1.6	-0.5
Transportation, Communication, Electric, Gas, and Sanitary Services	1,547	6.1	851	6.3	2,398	6.2	-0.1	-0.0
Wholesale Trade	301	1.2	198	1.5	499	1.3	-0.3	-0.1
Retail Trade	1,185	4.7	895	6.6	2,080	5.4	-1.9	-0.7*
Finance, Insurance, Real Estate	654	2.6	698	5.1	1,352	3.5	-2.5	-0.9*
Services	10,260	40.8	5,341	39.4	15,601	40.3	1.4	0.5
Public Administration	3,978	15.8	1,090	8.0	5,068	13.1	7.8	2.7*

(continued)

Appendix Exhibit I-2. Comparison of Establishment Respondents and Nonrespondents (continued)

Category	Respondents		Nonrespondents		Overall		Percent Difference Resp vs. Nonresp	Percent Difference Resp vs. Overall
	No.	%	No.	%	No.	%		
<b>NAICS Sector (effect size = 0.12)</b>								
Agriculture, Forestry, Fishing, and Hunting	698	2.8	323	2.4	1,021	2.6	0.4	0.1
Mining	802	3.2	417	3.1	1,219	3.1	0.1	0.0
Utilities	277	1.1	111	0.8	388	1.0	0.3	0.1
Construction	1,116	4.4	927	6.8	2,043	5.3	-2.4	-0.8*
Manufacturing	4,439	17.6	2,560	18.9	6,999	18.1	-1.2	-0.4
Wholesale Trade	301	1.2	198	1.5	499	1.3	-0.3	-0.1
Retail Trade	707	2.8	448	3.3	1,155	3.0	-0.5	-0.2
Transportation and Warehousing	915	3.6	419	3.1	1,334	3.4	0.5	0.2
Information	1,084	4.3	701	5.2	1,785	4.6	-0.9	-0.3
Finance and Insurance	617	2.5	680	5.0	1,297	3.3	-2.6	-0.9*
Real Estate and Rental and Leasing	164	0.7	100	0.7	264	0.7	-0.1	-0.0
Professional, Scientific, and Technical Services	1,073	4.3	613	4.5	1,686	4.4	-0.3	-0.1
Management of Companies and Enterprises	8	0.0	6	0.0	14	0.0	-0.0	-0.0
Administrative and Support and Waste Management and Remediation Services	366	1.5	281	2.1	647	1.7	-0.6	-0.2*
Educational Services	3,120	12.4	1,240	9.1	4,360	11.3	3.3	1.1*
Health Care and Social Assistance	2,688	10.7	1,546	11.4	4,234	10.9	-0.7	-0.3
Arts, Entertainment, and Recreation	1,238	4.9	627	4.6	1,865	4.8	0.3	0.1
Accommodation and Food Services	824	3.3	786	5.8	1,610	4.2	-2.5	-0.9*
Other Services, Except Public Administration	725	2.9	484	3.6	1,209	3.1	-0.7	-0.2
Public Administration	3,999	15.9	1,098	8.1	5,097	13.2	7.8	2.7*
<b>Number of Occupations on Establishment Sampling List (effect size = 0.11)</b>								
1-5	19,647	78.1	8,744	64.5	28,391	73.3	13.6	4.8*
6	945	3.8	819	6.0	1,764	4.6	-2.3	-0.8*
7	752	3.0	590	4.3	1,342	3.5	-1.4	-0.5*
8	592	2.4	502	3.7	1,094	2.8	-1.3	-0.5*
9	443	1.8	466	3.4	909	2.3	-1.7	-0.6*
10	2,782	11.1	2,444	18.0	5,226	13.5	-7.0	-2.4*

(continued)

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

Category	Respondents		Nonrespondents		Overall		Percent Difference Resp vs. Nonresp	Percent Difference Resp vs. Overall
	No.	%	No.	%	No.	%		
<b>Time Zone</b> (effect size = 0.03)								
Eastern Standard Time	12,155	48.3	6,596	48.6	18,751	48.4	-0.3	-0.1
Central Standard Time	7,030	27.9	3,663	27.0	10,693	27.6	0.9	0.3
Mountain Standard Time	1,932	7.7	886	6.5	2,818	7.3	1.1	0.4
Pacific Standard Time	3,794	15.1	2,328	17.2	6,122	15.8	-2.1	-0.7*
Alaska Standard Time	129	0.5	36	0.3	165	0.4	0.2	0.1
Hawaii Standard Time	121	0.5	56	0.4	177	0.5	0.1	0.0
<b>Metropolitan Status</b> (effect size = 0.05)								
Rural	5,524	22.0	2,173	16.0	7,697	19.9	5.9	2.1*
Urban	19,637	78.0	11,392	84.0	31,029	80.1	-5.9	-2.1*

Note: The percentages shown for each domain for Respondents, Nonrespondents, and Overall may not sum to 100% due to rounding. Because of rounding, the difference columns may not match their constituent parts. Statistical tests were conducted only for categories with two or more establishments. Percent differences are not calculated for the Total row. Beginning in 2017, RTI no longer samples under the category of 5,000 or more Total Employees in an Establishment. The category of 1,000–4,999 employees and 5,000 or more employees has been collapsed to 1,000+ to reflect the updated employee categories provided by Dun and Bradstreet, the frame vendor.

N/A = not applicable. SIC = Standard Industrial Classification. NAICS = North American Industry Classification System.

\*Statistically different from zero at the 0.05 level.



**Appendix Exhibit I-3. Unweighted Employee Response Rates**

Category	Sampled	Response Rate
<b>Total</b>	32,283	57.5
<b>Census Division</b>		
New England	2,251	53.7*
Middle Atlantic	4,596	57.1
East North Central	4,973	58.8
West North Central	3,004	59.5*
South Atlantic	5,104	58.3
East South Central	1,851	59.7*
West South Central	2,992	55.9
Mountain	3,010	61.2*
Pacific	4,502	53.6*
<b>Total Employees in Establishment</b>		
Unknown	502	58.2
1-4	1,218	68.6*
5-9	1,072	59.9
10-49	7,157	60.2*
50-99	5,644	58.2
100-249	4,394	59.1*
250-499	7,367	55.4*
500-999	2,814	53.9*
1,000+	2,115	47.2*
<b>SIC Division</b>		
Agriculture, Forestry, Fishing	1,029	61.9*
Mining	508	63.8*
Construction	1,392	51.0*
Manufacturing	4,084	60.2*
Transportation, Communication, Electric, Gas, and Sanitary Services	1,535	59.5
Wholesale Trade	282	56.7
Retail Trade	1,836	50.0*
Finance, Insurance, Real Estate	910	60.1
Services	18,081	56.9
Public Administration	2,626	61.0*

(continued)

**Appendix Exhibit I-3. Unweighted Employee Response Rates (continued)**

<b>Category</b>	<b>Sampled</b>	<b>Response Rate</b>
<b>NAICS Sector</b>		
Agriculture, Forestry, Fishing, and Hunting	435	67.6*
Mining	500	63.4*
Utilities	346	71.1*
Construction	1,400	51.2*
Manufacturing	4,043	60.3*
Wholesale Trade	282	56.7
Retail Trade	935	52.6*
Transportation and Warehousing	569	59.1
Information	1,115	57.0
Finance and Insurance	892	60.1
Real Estate and Rental and Leasing	126	63.5
Professional, Scientific, and Technical Services	890	61.3*
Management of Companies and Enterprises	5	80.0
Administrative and Support and Waste Management and Remediation Services	428	59.6
Educational Services	10,581	55.8*
Health Care and Social Assistance	2,553	58.8
Arts, Entertainment, and Recreation	1,632	58.3
Accommodation and Food Services	2,105	46.8*
Other Services, Except Public Administration	751	67.6*
Public Administration	2,695	61.0*

(continued)

**Appendix Exhibit I-3. Unweighted Employee Response Rates (continued)**

Category	Sampled	Response Rate
<b>Total Selected Employees in Establishment</b>		
1	1,393	68.8*
2	1,622	68.2*
3	1,707	60.5*
4	1,824	60.1*
5	1,790	60.1*
6	1,572	56.9
7	1,372	58.5
8	7,816	60.0*
9	1,017	59.0
10	1,000	56.6
11	748	57.1
12	804	58.3
13	1,079	51.9*
14	742	57.3
15	1,035	50.5*
16	1,760	47.1*
17	425	52.0*
18	360	59.2
19	437	45.8*
20	3,780	49.4*
<b>Questionnaire Type</b>		
Work Activities	10,898	56.0*
Work Context	10,532	59.2*
Knowledge	10,853	57.3
<b>Number of Occupations on Establishment Sampling List</b>		
1-5	15,274	61.6*
6	1,894	47.3*
7	1,141	51.8*
8	1,538	59.6
9	1,000	55.2
10	11,436	54.1*

(continued)

**Appendix Exhibit I-3. Unweighted Employee Response Rates (continued)**

<b>Category</b>	<b>Sampled</b>	<b>Response Rate</b>
<b>Occupation Class</b>		
Management Occupations	908	67.6*
Business and Financial Operations Occupations	873	65.6*
Computer and Mathematical Occupations	413	53.5
Architecture and Engineering Occupations	651	64.7*
Life, Physical, and Social Science Occupations	773	58.7
Community and Social Services Occupations	989	62.8*
Legal Occupations	563	58.3
Education, Training, and Library Occupations	9,089	55.0*
Arts, Design, Entertainment, Sports, and Media Occupations	1,566	52.4*
Healthcare Practitioners and Technical Occupations	989	57.4
Healthcare Support Occupations	506	58.1
Protective Service Occupations	982	58.6
Food Preparation and Serving Related Occupations	1,729	48.9*
Building and Grounds Cleaning and Maintenance Occupations	573	44.2*
Personal Care and Service Occupations	1,141	59.8
Sales and Related Occupations	1,495	55.1
Office and Administrative Support Occupations	2,179	62.8*
Farming, Fishing, and Forestry Occupations	452	69.5*
Construction and Extraction Occupations	1,267	50.7*
Installation, Maintenance, and Repair Occupations	1,404	59.5
Production Occupations	2,909	61.3*
Transportation and Material Moving Occupations	832	62.0*
Military Specific Occupations	0	—
<b>Time Zone</b>		
Eastern Standard Time	15,091	57.8
Central Standard Time	9,582	57.6
Mountain Standard Time	2,622	62.0*
Pacific Standard Time	4,652	53.7*
Alaska Standard Time	177	61.6
Hawaii Standard Time	159	54.7
<b>Metropolitan Status</b>		
Rural	8,076	61.3*
Urban	24,207	56.2*

Note: Statistical tests conducted only for categories with two or more employees. N/A = not applicable, SIC = Standard Industrial Classification. NAICS = North American Classification System. Beginning in 2017, RTI no longer samples under the category of 5,000 or more Total Employees in an Establishment. The category of 1,000-4,999 employees and 5,000 or more employees has been collapsed to 1,000+ to reflect the updated employee categories provided by Dun and Bradstreet, the frame vendor.

A dash (—) indicates that estimates do not apply because sample was not observed. SIC = Standard Industrial Classification. NAICS = North American Industry Classification System.

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

**Appendix Exhibit I-4. Comparison of Employee Respondents and Nonrespondents**

Category	Respondents		Nonrespondents		Overall		Percent Difference Resp vs. Nonresp	Percent Difference Resp vs. Overall
	No.	%	No.	%	No.	%		
<b>Total</b>	18,554	100.0	13,729	100.0	32,283	100.0	N/A	N/A
<b>Census Division (effect size = 0.04)</b>								
New England	1,208	6.5	1,043	7.6	2,251	7.0	-1.1	-0.5*
Middle Atlantic	2,626	14.2	1,970	14.3	4,596	14.2	-0.2	-0.1
East North Central	2,925	15.8	2,048	14.9	4,973	15.4	0.8	0.4
West North Central	1,787	9.6	1,217	8.9	3,004	9.3	0.8	0.3
South Atlantic	2,977	16.0	2,127	15.5	5,104	15.8	0.6	0.2
East South Central	1,105	6.0	746	5.4	1,851	5.7	0.5	0.2
West South Central	1,672	9.0	1,320	9.6	2,992	9.3	-0.6	-0.3
Mountain	1,842	9.9	1,168	8.5	3,010	9.3	1.4	0.6*
Pacific	2,412	13.0	2,090	15.2	4,502	13.9	-2.2	-0.9*
<b>Total Employees in Establishment (effect size = 0.07)</b>								
Unknown	292	1.6	210	1.5	502	1.6	0.0	0.0
1-4	836	4.5	382	2.8	1,218	3.8	1.7	0.7*
5-9	642	3.5	430	3.1	1,072	3.3	0.3	0.1
10-49	4,306	23.2	2,851	20.8	7,157	22.2	2.4	1.0*
50-99	3,285	17.7	2,359	17.2	5,644	17.5	0.5	0.2
100-249	2,596	14.0	1,798	13.1	4,394	13.6	0.9	0.4
250-499	4,082	22.0	3,285	23.9	7,367	22.8	-1.9	-0.8*
500-999	1,517	8.2	1,297	9.4	2,814	8.7	-1.3	-0.5*
1,000+	998	5.4	1,117	8.1	2,115	6.6	-2.8	-1.2*
<b>SIC Division (effect size = 0.05)</b>								
Agriculture, Forestry, Fishing	637	3.4	392	2.9	1,029	3.2	0.6	0.2
Mining	324	1.7	184	1.3	508	1.6	0.4	0.2
Construction	710	3.8	682	5.0	1,392	4.3	-1.1	-0.5*
Manufacturing	2,458	13.2	1,626	11.8	4,084	12.7	1.4	0.6*
Transportation, Communication, Electric, Gas, and Sanitary Services	914	4.9	621	4.5	1,535	4.8	0.4	0.2
Wholesale Trade	160	0.9	122	0.9	282	0.9	-0.0	-0.0
Retail Trade	918	4.9	918	6.7	1,836	5.7	-1.7	-0.7*
Finance, Insurance, Real Estate	547	2.9	363	2.6	910	2.8	0.3	0.1
Services	10,283	55.4	7,798	56.8	18,081	56.0	-1.4	-0.6
Public Administration	1,603	8.6	1,023	7.5	2,626	8.1	1.2	0.5*

(continued)

**Appendix Exhibit I-4. Comparison of Employee Respondents and Nonrespondents (continued)**

Category	Respondents		Nonrespondents		Overall		Percent Difference Resp vs. Nonresp	Percent Difference Resp vs. Overall
	No.	%	No.	%	No.	%		
<b>NAICS Sector (effect size = 0.08)</b>								
Agriculture, Forestry, Fishing, and Hunting	294	1.6	141	1.0	435	1.3	0.6	0.2*
Mining	317	1.7	183	1.3	500	1.5	0.4	0.2
Utilities	246	1.3	100	0.7	346	1.1	0.6	0.3*
Construction	717	3.9	683	5.0	1,400	4.3	-1.1	-0.5*
Manufacturing	2,438	13.1	1,605	11.7	4,043	12.5	1.4	0.6*
Wholesale Trade	160	0.9	122	0.9	282	0.9	-0.0	-0.0
Retail Trade	492	2.7	443	3.2	935	2.9	-0.6	-0.2
Transportation and Warehousing	336	1.8	233	1.7	569	1.8	0.1	0.0
Information	635	3.4	480	3.5	1,115	3.5	-0.1	-0.0
Finance and Insurance	536	2.9	356	2.6	892	2.8	0.3	0.1
Real Estate and Rental and Leasing	80	0.4	46	0.3	126	0.4	0.1	0.0
Professional, Scientific, and Technical Services	546	2.9	344	2.5	890	2.8	0.4	0.2
Management of Companies and Enterprises	4	0.0	1	0.0	5	0.0	0.0	0.0
Administrative and Support and Waste Management and Remediation Services	255	1.4	173	1.3	428	1.3	0.1	0.0
Educational Services	5,907	31.8	4,674	34.0	10,581	32.8	-2.2	-0.9*
Health Care and Social Assistance	1,500	8.1	1,053	7.7	2,553	7.9	0.4	0.2
Arts, Entertainment, and Recreation	952	5.1	680	5.0	1,632	5.1	0.2	0.1
Accommodation and Food Services	986	5.3	1,119	8.2	2,105	6.5	-2.8	-1.2*
Other Services, Except Public Administration	508	2.7	243	1.8	751	2.3	1.0	0.4*
Public Administration	1,645	8.9	1,050	7.6	2,695	8.3	1.2	0.5*

(continued)

**Appendix Exhibit I-4. Comparison of Employee Respondents and Nonrespondents (continued)**

Category	Respondents		Nonrespondents		Overall		Percent Difference Resp vs. Nonresp	Percent Difference Resp vs. Overall
	No.	%	No.	%	No.	%		
<b>Total Selected Employees in Establishment (effect size = 0.10)</b>								
1	958	5.2	435	3.2	1,393	4.3	2.0	0.8*
2	1,107	6.0	515	3.8	1,622	5.0	2.2	0.9*
3	1,032	5.6	675	4.9	1,707	5.3	0.6	0.3
4	1,097	5.9	727	5.3	1,824	5.7	0.6	0.3
5	1,076	5.8	714	5.2	1,790	5.5	0.6	0.3
6	894	4.8	678	4.9	1,572	4.9	-0.1	-0.1
7	803	4.3	569	4.1	1,372	4.2	0.2	0.1
8	4,688	25.3	3,128	22.8	7,816	24.2	2.5	1.1*
9	600	3.2	417	3.0	1,017	3.2	0.2	0.1
10	566	3.1	434	3.2	1,000	3.1	-0.1	-0.0
11	427	2.3	321	2.3	748	2.3	-0.0	-0.0
12	469	2.5	335	2.4	804	2.5	0.1	0.0
13	560	3.0	519	3.8	1,079	3.3	-0.8	-0.3
14	425	2.3	317	2.3	742	2.3	-0.0	-0.0
15	523	2.8	512	3.7	1,035	3.2	-0.9	-0.4*
16	829	4.5	931	6.8	1,760	5.5	-2.3	-1.0*
17	221	1.2	204	1.5	425	1.3	-0.3	-0.1
18	213	1.1	147	1.1	360	1.1	0.1	0.0
19	200	1.1	237	1.7	437	1.4	-0.6	-0.3*
20	1,866	10.1	1,914	13.9	3,780	11.7	-3.9	-1.7*
<b>Questionnaire Type (effect size = 0.02)</b>								
Work Activities	6,108	32.9	4,790	34.9	10,898	33.8	-2.0	-0.8*
Work Context	6,230	33.6	4,302	31.3	10,532	32.6	2.2	1.0*
Knowledge	6,216	33.5	4,637	33.8	10,853	33.6	-0.3	-0.1
<b>Number of Occupations on Establishment Sampling List (effect size = 0.08)</b>								
1-5	9,409	50.7	5,865	42.7	15,274	47.3	8.0	3.4*
6	895	4.8	999	7.3	1,894	5.9	-2.5	-1.0*
7	591	3.2	550	4.0	1,141	3.5	-0.8	-0.3*
8	916	4.9	622	4.5	1,538	4.8	0.4	0.2
9	552	3.0	448	3.3	1,000	3.1	-0.3	-0.1
10	6,191	33.4	5,245	38.2	11,436	35.4	-4.8	-2.1*

(continued)

**Appendix Exhibit I-4. Comparison of Employee Respondents and Nonrespondents (continued)**

Category	Respondents		Nonrespondents		Overall		Percent Difference Resp vs. Nonresp	Percent Difference Resp vs. Overall
	No.	%	No.	%	No.	%		
<b>Occupation Class (effect size = 0.09)</b>								
Management Occupations	614	3.3	294	2.1	908	2.8	1.2	0.5*
Business and Financial Operations Occupations	573	3.1	300	2.2	873	2.7	0.9	0.4*
Computer and Mathematical Occupations	221	1.2	192	1.4	413	1.3	-0.2	-0.1
Architecture and Engineering Occupations	421	2.3	230	1.7	651	2.0	0.6	0.3*
Life, Physical, and Social Science Occupations	454	2.4	319	2.3	773	2.4	0.1	0.1
Community and Social Services Occupations	621	3.3	368	2.7	989	3.1	0.7	0.3*
Legal Occupations	328	1.8	235	1.7	563	1.7	0.1	0.0
Education, Training, and Library Occupations	5,002	27.0	4,087	29.8	9,089	28.2	-2.8	-1.2*
Arts, Design, Entertainment, Sports, and Media Occupations	821	4.4	745	5.4	1,566	4.9	-1.0	-0.4*
Healthcare Practitioners and Technical Occupations	568	3.1	421	3.1	989	3.1	-0.0	-0.0
Healthcare Support Occupations	294	1.6	212	1.5	506	1.6	0.0	0.0
Protective Service Occupations	575	3.1	407	3.0	982	3.0	0.1	0.1
Food Preparation and Serving Related Occupations	845	4.6	884	6.4	1,729	5.4	-1.9	-0.8*
Building and Grounds Cleaning and Maintenance Occupations	253	1.4	320	2.3	573	1.8	-1.0	-0.4*
Personal Care and Service Occupations	682	3.7	459	3.3	1,141	3.5	0.3	0.1
Sales and Related Occupations	823	4.4	672	4.9	1,495	4.6	-0.5	-0.2
Office and Administrative Support Occupations	1,368	7.4	811	5.9	2,179	6.7	1.5	0.6*
Farming, Fishing, and Forestry Occupations	314	1.7	138	1.0	452	1.4	0.7	0.3*
Construction and Extraction Occupations	642	3.5	625	4.6	1,267	3.9	-1.1	-0.5*
Installation, Maintenance, and Repair Occupations	836	4.5	568	4.1	1,404	4.3	0.4	0.2
Production Occupations	1,783	9.6	1,126	8.2	2,909	9.0	1.4	0.6*
Transportation and Material Moving Occupations	516	2.8	316	2.3	832	2.6	0.5	0.2
Military Specific Occupations	0	0.0	0	0.0	0	0.0	—	—

(continued)



**Appendix Exhibit I-4. Comparison of Employee Respondents and Nonrespondents (continued)**

Category	Respondents		Nonrespondents		Overall		Percent Difference Resp vs. Nonresp	Percent Difference Resp vs. Overall
	No.	%	No.	%	No.	%		
<b>Time Zone</b> (effect size = 0.03)								
Eastern Standard Time	8,721	47.0	6,370	46.4	15,091	46.7	0.6	0.3
Central Standard Time	5,515	29.7	4,067	29.6	9,582	29.7	0.1	0.0
Mountain Standard Time	1,626	8.8	996	7.3	2,622	8.1	1.5	0.6*
Pacific Standard Time	2,496	13.5	2,156	15.7	4,652	14.4	-2.3	-1.0*
Alaska Standard Time	109	0.6	68	0.5	177	0.5	0.1	0.0
Hawaii Standard Time	87	0.5	72	0.5	159	0.5	-0.1	-0.0
<b>Metropolitan Status</b> (effect size = 0.04)								
Rural	4,953	26.7	3,123	22.7	8,076	25.0	3.9	1.7*
Urban	13,601	73.3	10,606	77.3	24,207	75.0	-3.9	-1.7*

Notes: The percentages shown for each domain for Respondents, Nonrespondents, and Overall may not sum to 100% due to rounding. Because of rounding, the difference columns may not match their constituent parts. Statistical tests conducted only for categories with two or more employees. Percent differences are not calculated for the Total row. Beginning in 2017, RTI no longer samples under the category of 5,000 or more Total Employees in an Establishment. The category of 1,000-4,999 employees and 5,000 or more employees has been collapsed to 1,000+ to reflect the updated employee categories provided by Dun and Bradstreet, the frame vendor.

A dash (—) indicates that estimates do not apply because sample was not observed for either respondents or nonrespondents. N/A = not applicable, NAICS = North American Classification System, SIC = Standard Industrial Classification.

\*Statistically different from zero at the 0.05 level.

**Appendix Exhibit I-5. Ten Lowest Item Response Rates, Work Activities Questionnaire**

Item and Description	Sampled	Response Rate
B22-Level Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.	2,553	95.2
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.	2,386	95.3
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.	2,644	95.7
B32-Level Performing for people or dealing directly with the public. This includes serving customers in restaurants and stores, and receiving clients or guests.	4,162	95.7
B05-Level Estimating sizes, distances, and quantities; or determining time, costs, resources, or materials needed to perform a work activity.	4,354	95.8
B40-Level Recruiting, interviewing, selecting, hiring, and promoting employees in an organization.	2,849	95.8
B06-Level Assessing the value, importance, or quality of things or people.	4,866	96.2
B13-Level Establishing long-range objectives and specifying the strategies and actions to achieve them.	4,756	96.2
B20-Level Running, maneuvering, navigating, or driving vehicles or mechanized equipment, such as forklifts, passenger vehicles, aircraft, or water craft.	2,833	96.2
B18-Level Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles).	3,639	96.3
B09-Level Identifying the underlying principles, reasons, or facts of information by breaking down information or data into separate parts.	4,804	96.4
B25-Level Translating or explaining what information means and how it can be used.	4,810	96.4
B02-Level Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.	5,221	96.5
B30-Level Convincing others to buy merchandise/goods or to otherwise change their minds or actions.	3,529	96.5
B04-Level Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.	4,277	96.7
B41-Level Monitoring and controlling resources and overseeing the spending of money.	3,776	96.7

(continued)

**Appendix Exhibit I-5. Ten Lowest Item Response Rates, Work Activities  
Questionnaire (continued)**

Item and Description	Sampled	Response Rate
B11-Level Developing, designing, or creating new applications, ideas, relationships, systems, or products, including artistic contributions.	4,951	96.8
B14-Level Scheduling events, programs, and activities, as well as the work of others.	4,701	96.8

Note. 18 items are shown because of ties in response rates.

**Appendix Exhibit I-6. Ten Lowest Item Response Rates, Work Context Questionnaire**

Item and Description	Sampled	Response Rate
D49 How automated is the job?	5,739	97.6
D01 How often do you have to have face-to-face discussions with individuals or teams in this job?	5,739	97.8
D45 How serious would the result usually be if the worker made a mistake that was not readily correctable?	5,739	97.8
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?	5,739	98.1
D39 How much does this job require keeping or regaining your balance?	5,739	98.2
D53 To what extent does this job require the worker to compete or to be aware of competitive pressures?	5,739	98.2
D09 How important is it to coordinate or lead others in accomplishing work activities in this job?	5,739	98.4
D29 How often does this job require exposure to disease/infections?	5,739	98.4
D05 How often does the job require written letters and memos?	5,739	98.5
D25 How often does this job require working exposed to contaminants (such as pollutants, gases, dust or odors)?	5,739	98.5
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?	5,739	98.5
D23 How often does this job require working in very hot (above 90 F degrees) or very cold (below 32 F degrees) temperatures?	5,739	98.6
D55 How important is it to this job that the pace is determined by the speed of equipment or machinery? (This does not refer to keeping busy at all times on this job.)	5,739	98.6
D03 How often do you have telephone conversations in this job?	5,739	98.7
D11 How responsible is the worker for work outcomes and results of other workers?	5,739	98.7
D13 How frequently does the worker have to deal with unpleasant, angry, or discourteous individuals as part of the job requirements?	5,739	98.7
D15 How often does this job require working indoors in environmentally controlled conditions?	5,739	98.8
D21 To what extent does this job require the worker to perform job tasks in close physical proximity to other people?	5,739	98.8
D33 How often does this job require exposure to minor burns, cuts, bites, or stings?	5,739	98.8
D46 What results do your decisions usually have on other people or the image or reputation or financial resources of your employer?	5,739	98.8
D17 How often does this job require working outdoors, exposed to all weather conditions?	5,739	98.9

(continued)

**Appendix Exhibit I-6. Ten Lowest Item Response Rates, Work Context  
Questionnaire (continued)**

<b>Item and Description</b>	<b>Sampled</b>	<b>Response Rate</b>
D19 How often does this job require working in an open vehicle or equipment (e.g., tractor)?	5,739	98.9
D28 How often does this job require exposure to radiation?	5,739	98.9
D40 How much does this job require using your hands to handle, control, or feel objects, tools or controls?	5,739	98.9
D41 How much does this job require bending or twisting your body?	5,739	98.9
D43 How much does this job require wearing common protective or safety equipment such as safety shoes, glasses, gloves, hard hats or life jackets?	5,739	98.9

Note. 26 items are shown because of ties in response rates.

**Appendix Exhibit I-7. Ten Lowest Item Response Rates, Knowledge Questionnaire**

<b>Item</b>	<b>Item Description</b>	<b>Sampled</b>	<b>Response Rate</b>
E08-Level	Knowledge of techniques and equipment for planting, growing, and harvesting food products (both plant and animal) for consumption, including storage/handling techniques.	1,139	91.7
E26-Level	Knowledge of the theory and techniques required to compose, produce, and perform works of music, dance, visual arts, drama, and sculpture.	1,564	94.1
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.	1,835	95.2
E27-Level	Knowledge of historical events and their causes, indicators, and effects on civilizations and cultures.	2,224	95.7
E07-Level	Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.	3,060	95.9
E17-Level	Knowledge of plant and animal organisms, their tissues, cells, functions, interdependencies, and interactions with each other and the environment.	2,066	96.0
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.	2,906	96.1
E11-Level	Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models.	2,667	96.3
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.	2,487	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.	2,264	96.4
E15-Level	Knowledge and prediction of physical principles, laws, their interrelationships, and applications to understanding fluid, material, and atmospheric dynamics, and mechanical, electrical, atomic and sub- atomic structures and processes.	2,461	96.5
E22-Level	Knowledge of principles, methods, and procedures for diagnosis, treatment, and rehabilitation of physical and mental dysfunctions, and for career counseling and guidance.	2,786	96.5
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.	2,522	96.5

Note. 13 items are shown because of ties in response rates.

**Appendix Exhibit I-8. Ten Lowest Item Response Rates, Task Questionnaire**

Item	Item Description	Sampled	Response Rate
37-2012.00, Maids and Housekeeping Cleaners: T18-Frequency	Purchase or order groceries and household supplies to keep kitchens stocked and record expenditures.	17	41.2
47-2061.00, Construction Laborers: T28-Importance	Use computers or other input devices to control robotic pipe cutters or cleaners.	7	42.9
51-6091.00, Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers: T7-Frequency	Pass sliver strands through openings in floors to workers on floors below who wind slivers onto tubes.	7	42.9
37-2012.00, Maids and Housekeeping Cleaners: T25-Frequency	Care for children or elderly persons by overseeing their activities, providing companionship, and assisting them with dressing, bathing, eating, and other needs.	15	46.7
51-6091.00, Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers: T4-Frequency	Turn petcocks to adjust the flow of binding fluid to sleeves.	11	54.5
13-2011.01, Accountants: T2-Frequency	Serve as bankruptcy trustees or business valuers.	9	55.6
45-2021.00, Animal Breeders: T15-Frequency	Attach rubber collecting sheaths to genitals of tethered bull and stimulate animal's organ to induce ejaculation.	9	55.6
51-6091.00, Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers: T7-Importance	Pass sliver strands through openings in floors to workers on floors below who wind slivers onto tubes.	7	57.1
37-2012.00, Maids and Housekeeping Cleaners: T1-Frequency	Plan menus and cook and serve meals and refreshments following employer's instructions or own methods.	17	58.8
37-2012.00, Maids and Housekeeping Cleaners: T6-Importance	Run errands, such as taking laundry to the cleaners and buying groceries.	20	60.0
37-2012.00, Maids and Housekeeping Cleaners: T6-Frequency	Run errands, such as taking laundry to the cleaners and buying groceries.	20	60.0
33-9011.00, Animal Control Workers: T5-Frequency	Train police officers in dog handling and training techniques for tracking, crowd control, and narcotics and bomb detection.	13	61.5
27-4031.00, Camera Operators, Television, Video, and Motion Picture: T25-Frequency	Receive raw film stock and maintain film inventories.	8	62.5

Note. 13 items are shown because of ties in response rates.

**Appendix Exhibit I-9. Response Rates, Background Questionnaire**

	<b>Item and Description</b>	<b>Sampled</b>	<b>Response Rate</b>
2	How long at job?	16,987	99.3
3	Employment sector	16,987	96.2
4	Family business	16,987	89.2
5	Age group	16,987	95.5
6	Gender	16,987	98.0
7	Ethnicity	16,987	97.2
8	Race	16,987	93.8
9	Education level	16,987	99.1
10	Deafness or serious difficulty hearing	16,987	98.6
11	Blind or serious difficulty seeing even when wearing glasses	16,987	98.4
12A	Serious difficulty concentrating, remembering, or making decisions	16,987	97.9
12B	Serious difficulty walking or climbing stairs	16,987	98.5
12C	Difficulty dressing or bathing	16,987	98.2
13	Difficulty doing errands alone because of a physical, mental, or emotional condition	16,987	98.3

**Appendix Exhibit I-10. Item Response Rates by Item Type**

	<b>Item Type</b>	<b>Questions</b>	<b>Response Rate</b>
	TOTAL	2,242,778	97.9
	B--Work Activities--Importance	228,124	98.7
	B--Work--Activities--Level	182,799	96.9
	D--Work Context	327,123	98.9
	E--Knowledge--Education and Training	22,736	98.9
	E--Knowledge--Importance	187,572	98.7
	E--Knowledge--Level	107,932	97.1
	E--Knowledge--Work Styles Background	90,944	99.4
	Background	135,896	96.0
	Task--Relevance	374,238	98.9
	Task--Importance	292,707	97.1
	Task--Frequency	292,707	96.3



**Appendix Exhibit I-11. Item Response Rates by Occupation**

<b>SOC Code</b>	<b>SOC Title</b>	<b>Questions</b>	<b>Response Rate</b>
<b>TOTAL</b>		2,242,778	97.9
37-2012.00	Maids and Housekeeping Cleaners	11,891	93.3
47-2051.00	Cement Masons and Concrete Finishers	9,211	94.2
51-9123.00	Painting, Coating, and Decorating Workers	5,984	94.6
31-1014.00	Nursing Assistants	13,535	94.7
51-6064.00	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	8,632	95.1
47-2071.00	Paving, Surfacing, and Tamping Equipment Operators	5,544	95.2
45-2021.00	Animal Breeders	6,537	95.3
33-3011.00	Bailiffs	5,856	95.5
51-4052.00	Pourers and Casters, Metal	8,528	95.6
37-1011.00	First-Line Supervisors of Housekeeping and Janitorial Workers	9,757	95.7
51-6052.00	Tailors, Dressmakers, and Custom Sewers	8,533	95.7
35-2014.00	Cooks, Restaurant	13,223	95.8
39-3011.00	Gaming Dealers	11,494	95.8
51-9031.00	Cutters and Trimmers, Hand	6,333	95.9
47-2061.00	Construction Laborers	8,806	96.0
53-3021.00	Bus Drivers, Transit and Intercity	11,050	96.0
53-7064.00	Packers and Packagers, Hand	7,965	96.0
45-2091.00	Agricultural Equipment Operators	8,218	96.1
41-2011.00	Cashiers	16,986	96.2
35-2012.00	Cooks, Institution and Cafeteria	17,040	96.3
45-2093.00	Farmworkers, Farm, Ranch, and Aquacultural Animals	10,417	96.3
11-2011.00	Advertising and Promotions Managers	10,371	96.4
35-2011.00	Cooks, Fast Food	6,853	96.4
35-2015.00	Cooks, Short Order	8,865	96.4
51-6062.00	Textile Cutting Machine Setters, Operators, and Tenders	8,048	96.4
51-6091.00	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers	7,378	96.4
51-9196.00	Paper Goods Machine Setters, Operators, and Tenders	8,804	96.4
41-2012.00	Gaming Change Persons and Booth Cashiers	9,213	96.5
51-9197.00	Tire Builders	7,973	96.5
43-4121.00	Library Assistants, Clerical	13,683	96.6
25-2011.00	Preschool Teachers, Except Special Education	16,158	96.8
51-2091.00	Fiberglass Laminators and Fabricators	7,428	96.8
39-6011.00	Baggage Porters and Bellhops	6,300	96.9

(continued)

**Appendix Exhibit I-11. Item Response Rates by Occupation (continued)**

<b>SOC Code</b>	<b>SOC Title</b>	<b>Questions</b>	<b>Response Rate</b>
23-2091.00	Court Reporters	6,919	97.0
35-3031.00	Waiters and Waitresses	17,609	97.0
39-5011.00	Barbers	8,093	97.0
51-4192.00	Layout Workers, Metal and Plastic	6,965	97.0
53-3022.00	Bus Drivers, School or Special Client	9,204	97.0
53-7073.00	Wellhead Pumpers	7,011	97.0
25-1122.00	Communications Teachers, Postsecondary	8,979	97.1
37-3013.00	Tree Trimmers and Pruners	8,302	97.1
43-3071.00	Tellers	11,367	97.1
47-2021.00	Brickmasons and Blockmasons	6,322	97.1
25-2053.00	Special Education Teachers, Middle School	17,518	97.2
49-9031.00	Home Appliance Repairers	10,165	97.2
51-4023.00	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	10,216	97.2
51-9061.00	Inspectors, Testers, Sorters, Samplers, and Weighers	9,379	97.2
25-9041.00	Teacher Assistants	24,223	97.3
29-1131.00	Veterinarians	10,434	97.3
35-3041.00	Food Servers, Nonrestaurant	8,649	97.3
51-4041.00	Machinists	11,923	97.3
13-1071.00	Human Resources Specialists	17,428	97.4
21-1091.00	Health Educators	7,284	97.4
27-4011.00	Audio and Video Equipment Technicians	10,151	97.4
33-9031.00	Gaming Surveillance Officers and Gaming Investigators	8,737	97.4
39-7011.00	Tour Guides and Escorts	8,481	97.4
43-9021.00	Data Entry Keyers	5,062	97.4
49-3021.00	Automotive Body and Related Repairers	6,739	97.4
49-3023.01	Automotive Master Mechanics	11,928	97.4
17-3021.00	Aerospace Engineering and Operations Technicians	5,186	97.5
27-2012.02	Directors- Stage, Motion Pictures, Television, and Radio	6,442	97.5
35-9031.00	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	13,425	97.5
43-5071.00	Shipping, Receiving, and Traffic Clerks	8,111	97.5
43-5111.00	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	11,485	97.5
49-3043.00	Rail Car Repairers	8,767	97.5
51-4051.00	Metal-Refining Furnace Operators and Tenders	7,001	97.5
53-3031.00	Driver/Sales Workers	4,618	97.5

(continued)

**Appendix Exhibit I-11. Item Response Rates by Occupation (continued)**

<b>SOC Code</b>	<b>SOC Title</b>	<b>Questions</b>	<b>Response Rate</b>
13-1031.02	Insurance Adjusters, Examiners, and Investigators	8,687	97.6
17-3011.01	Architectural Drafters	6,828	97.6
25-1081.00	Education Teachers, Postsecondary	8,537	97.6
25-1111.00	Criminal Justice and Law Enforcement Teachers, Postsecondary	9,042	97.6
25-1124.00	Foreign Language and Literature Teachers, Postsecondary	9,983	97.6
31-2012.00	Occupational Therapy Aides	6,854	97.6
33-2011.02	Forest Firefighters	6,981	97.6
35-3022.00	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	9,364	97.6
41-2031.00	Retail Salespersons	12,061	97.6
47-4031.00	Fence Erectors	8,046	97.6
49-9099.01	Geothermal Technicians	8,374	97.6
25-1194.00	Vocational Education Teachers, Postsecondary	15,291	97.7
25-2032.00	Career/Technical Education Teachers, Secondary School	20,171	97.7
27-4031.00	Camera Operators, Television, Video, and Motion Picture	7,622	97.7
41-1012.00	First-Line Supervisors of Non-Retail Sales Workers	10,110	97.7
21-1012.00	Educational, Guidance, School, and Vocational Counselors	16,597	97.8
25-1125.00	History Teachers, Postsecondary	9,526	97.8
25-1192.00	Home Economics Teachers, Postsecondary	14,441	97.8
27-1014.00	Multimedia Artists and Animators	6,802	97.8
31-2021.00	Physical Therapist Assistants	8,129	97.8
39-3021.00	Motion Picture Projectionists	9,468	97.8
49-2093.00	Electrical and Electronics Installers and Repairers, Transportation Equipment	5,958	97.8
13-2021.01	Assessors	7,647	97.9
19-4093.00	Forest and Conservation Technicians	11,798	97.9
21-1092.00	Probation Officers and Correctional Treatment Specialists	14,094	97.9
25-1123.00	English Language and Literature Teachers, Postsecondary	16,235	97.9
43-6014.00	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	25,367	97.9
49-3053.00	Outdoor Power Equipment and Other Small Engine Mechanics	6,152	97.9
49-9098.00	Helpers--Installation, Maintenance, and Repair Workers	10,277	97.9
11-9151.00	Social and Community Service Managers	8,501	98.0
25-1064.00	Geography Teachers, Postsecondary	15,867	98.0
25-1112.00	Law Teachers, Postsecondary	13,735	98.0

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**Appendix Exhibit I-11. Item Response Rates by Occupation (continued)**

<b>SOC Code</b>	<b>SOC Title</b>	<b>Questions</b>	<b>Response Rate</b>
39-9041.00	Residential Advisors	12,641	98.0
47-2073.00	Operating Engineers and Other Construction Equipment Operators	9,123	98.0
51-5112.00	Printing Press Operators	8,393	98.0
11-3051.04	Biomass Power Plant Managers	8,124	98.1
13-1011.00	Agents and Business Managers of Artists, Performers, and Athletes	7,039	98.1
13-2011.01	Accountants	14,882	98.1
29-1069.07	Pathologists	10,310	98.1
41-2021.00	Counter and Rental Clerks	7,648	98.1
21-1013.00	Marriage and Family Therapists	8,393	98.2
21-1093.00	Social and Human Service Assistants	8,177	98.2
25-2023.00	Career/Technical Education Teachers, Middle School	11,725	98.2
27-2012.04	Talent Directors	7,370	98.2
29-2056.00	Veterinary Technologists and Technicians	13,353	98.2
43-9011.00	Computer Operators	10,275	98.2
43-9061.00	Office Clerks, General	28,958	98.2
49-9021.02	Refrigeration Mechanics and Installers	7,626	98.2
51-2092.00	Team Assemblers	8,399	98.2
51-8031.00	Water and Wastewater Treatment Plant and System Operators	8,071	98.2
51-9195.05	Potters, Manufacturing	6,977	98.2
11-9032.00	Education Administrators, Elementary and Secondary School	16,994	98.3
15-1131.00	Computer Programmers	8,375	98.3
17-3027.00	Mechanical Engineering Technicians	6,756	98.3
23-1021.00	Administrative Law Judges, Adjudicators, and Hearing Officers	8,395	98.3
25-1051.00	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	16,086	98.3
25-1062.00	Area, Ethnic, and Cultural Studies Teachers, Postsecondary	17,532	98.3
25-1067.00	Sociology Teachers, Postsecondary	14,802	98.3
27-2012.05	Technical Directors/Managers	5,589	98.3
39-2021.00	Nonfarm Animal Caretakers	14,040	98.3
41-3021.00	Insurance Sales Agents	8,221	98.3
49-9096.00	Riggers	6,859	98.3
11-9033.00	Education Administrators, Postsecondary	16,412	98.4

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**Appendix Exhibit I-11. Item Response Rates by Occupation (continued)**

<b>SOC Code</b>	<b>SOC Title</b>	<b>Questions</b>	<b>Response Rate</b>
25-1063.00	Economics Teachers, Postsecondary	9,755	98.4
25-1065.00	Political Science Teachers, Postsecondary	13,962	98.4
25-1193.00	Recreation and Fitness Studies Teachers, Postsecondary	11,771	98.4
25-9011.00	Audio-Visual and Multimedia Collections Specialists	7,790	98.4
29-2092.00	Hearing Aid Specialists	5,844	98.4
39-3091.00	Amusement and Recreation Attendants	8,204	98.4
41-1011.00	First-Line Supervisors of Retail Sales Workers	10,474	98.4
43-3011.00	Bill and Account Collectors	7,856	98.4
49-9064.00	Watch Repairers	6,141	98.4
51-1011.00	First-Line Supervisors of Production and Operating Workers	13,022	98.4
19-4099.01	Bioinformatics Technicians	7,928	98.5
25-1021.00	Computer Science Teachers, Postsecondary	13,077	98.5
25-2021.00	Elementary School Teachers, Except Special Education	32,252	98.5
25-2054.00	Special Education Teachers, Secondary School	22,037	98.5
25-9031.00	Instructional Coordinators	9,406	98.5
27-2042.01	Singers	5,875	98.5
27-4032.00	Film and Video Editors	7,541	98.5
33-1011.00	First-Line Supervisors of Correctional Officers	13,669	98.5
33-2021.02	Fire Investigators	6,308	98.5
41-3011.00	Advertising Sales Agents	11,493	98.5
41-4012.00	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	8,080	98.5
51-8099.03	Biomass Plant Technicians	18,098	98.5
21-1015.00	Rehabilitation Counselors	10,457	98.6
21-1021.00	Child, Family, and School Social Workers	8,099	98.6
25-1011.00	Business Teachers, Postsecondary	15,079	98.6
25-1053.00	Environmental Science Teachers, Postsecondary	24,164	98.6
25-1066.00	Psychology Teachers, Postsecondary	14,109	98.6
25-3011.00	Adult Basic and Secondary Education and Literacy Teachers and Instructors	11,151	98.6
27-2022.00	Coaches and Scouts	16,268	98.6
29-1062.00	Family and General Practitioners	6,670	98.6
31-9096.00	Veterinary Assistants and Laboratory Animal Caretakers	9,855	98.6
33-9011.00	Animal Control Workers	6,332	98.6
43-4051.03	Patient Representatives	6,556	98.6
43-4141.00	New Accounts Clerks	6,102	98.6

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**Appendix Exhibit I-11. Item Response Rates by Occupation (continued)**

<b>SOC Code</b>	<b>SOC Title</b>	<b>Questions</b>	<b>Response Rate</b>
15-1122.00	Information Security Analysts	7,765	98.7
23-2011.00	Paralegals and Legal Assistants	10,314	98.7
25-1022.00	Mathematical Science Teachers, Postsecondary	15,847	98.7
25-1031.00	Architecture Teachers, Postsecondary	9,516	98.7
25-1054.00	Physics Teachers, Postsecondary	17,375	98.7
25-1061.00	Anthropology and Archeology Teachers, Postsecondary	16,274	98.7
25-1121.00	Art, Drama, and Music Teachers, Postsecondary	21,724	98.7
25-2022.00	Middle School Teachers, Except Special and Career/Technical Education	21,258	98.7
25-3021.00	Self-Enrichment Education Teachers	12,275	98.7
27-1021.00	Commercial and Industrial Designers	6,510	98.7
27-2031.00	Dancers	5,848	98.7
43-6012.00	Legal Secretaries	10,614	98.7
43-9041.02	Insurance Policy Processing Clerks	6,814	98.7
47-1011.00	First-Line Supervisors of Construction Trades and Extraction Workers	12,087	98.7
47-2072.00	Pile-Driver Operators	6,251	98.7
53-7121.00	Tank Car, Truck, and Ship Loaders	10,274	98.7
11-9041.00	Architectural and Engineering Managers	7,730	98.8
11-9199.02	Compliance Managers	11,700	98.8
17-2151.00	Mining and Geological Engineers, Including Mining Safety Engineers	8,113	98.8
19-4061.00	Social Science Research Assistants	8,985	98.8
25-1042.00	Biological Science Teachers, Postsecondary	17,213	98.8
25-1072.00	Nursing Instructors and Teachers, Postsecondary	16,234	98.8
25-1082.00	Library Science Teachers, Postsecondary	8,096	98.8
25-2031.00	Secondary School Teachers, Except Special and Career/Technical Education	20,112	98.8
25-2051.00	Special Education Teachers, Preschool	11,441	98.8
27-4012.00	Broadcast Technicians	9,349	98.8
29-1065.00	Pediatricians, General	7,896	98.8
45-1011.06	First-Line Supervisors of Aquacultural Workers	8,611	98.8
47-5081.00	Helpers--Extraction Workers	5,303	98.8
13-2072.00	Loan Officers	8,210	98.9
15-1111.00	Computer and Information Research Scientists	5,633	98.9
17-2112.00	Industrial Engineers	10,978	98.9
17-2171.00	Petroleum Engineers	7,679	98.9

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**Appendix Exhibit I-11. Item Response Rates by Occupation (continued)**

<b>SOC Code</b>	<b>SOC Title</b>	<b>Questions</b>	<b>Response Rate</b>
25-1126.00	Philosophy and Religion Teachers, Postsecondary	13,633	98.9
29-1123.00	Physical Therapists	11,218	98.9
19-2012.00	Physicists	6,547	99.0
25-1041.00	Agricultural Sciences Teachers, Postsecondary	10,090	99.0
25-1043.00	Forestry and Conservation Science Teachers, Postsecondary	9,632	99.0
33-9092.00	Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	10,747	99.0
19-3031.01	School Psychologists	7,977	99.1
23-1023.00	Judges, Magistrate Judges, and Magistrates	8,133	99.1
25-1071.00	Health Specialties Teachers, Postsecondary	7,806	99.1
33-2022.00	Forest Fire Inspectors and Prevention Specialists	7,126	99.1
25-4012.00	Curators	11,892	99.2
25-4013.00	Museum Technicians and Conservators	8,921	99.2
29-1199.01	Acupuncturists	6,413	99.2
49-2021.01	Radio Mechanics	5,999	99.2
25-1032.00	Engineering Teachers, Postsecondary	7,635	99.3
25-1052.00	Chemistry Teachers, Postsecondary	15,785	99.3
19-1031.02	Range Managers	6,943	99.4