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## ***Appendix E: 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 13–15.<sup>1</sup> Data from the Occupation Expert (OE) Method does not lend itself 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.

### E.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

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

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

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<sup>1</sup> A total of 15 analysis cycles have been completed through June 2014. An analysis of nonresponse in Analysis Cycles 1–3 was included in the September 2, 2005, Office of Management and Budget submission (Appendix E); an analysis of nonresponse in Cycles 4–8 was included in the December 10, 2008, Office of Management and Budget submission (Appendix H); and an analysis of nonresponse in Cycles 9–12 was included in the April 10, 2012, Office of Management and Budget submission (Appendix E).

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

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>

## E.2 Establishment Nonresponse

Exhibits E-1 and E-2 (at the end of this appendix) display, respectively, the establishment eligibility and response rates for Analysis Cycles 13–15 by stage of data collection, and a comparison of the distribution of respondents and the distribution of nonrespondents across various establishment

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

attributes. The analysis population of establishments includes any establishment that had at least one of its assigned occupations published in Analysis Cycles 13–15, whether or not any of the occupations were eventually selected from that establishment. 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 were likely to be related<sup>3</sup> to the primary outcome variables of the O\*NET Program.

The following describes the major row headings within Exhibits E-1 and E-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.

## E.2.1 Establishment Final Unweighted Response Rates

Exhibit E-1 displays the establishment eligibility and response rates for Analysis Cycles 13–15 by stage of data collection.

The following describes the Exhibit E-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 establishments that responded at the verification stage. Final rates are combined rates across all stages of data collection. All establishments are considered to be eligible at the verification stage. At subsequent stages, 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 are 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 are 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,

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<sup>3</sup> Based on logistic regression modeling results of establishment-level response propensity.

and (4) not a duplicate. Establishments that have no employees in the list of occupations asked about during data collection are not considered survey ineligible but instead are considered to be sampling-stage respondents.

- *Resp* is the percentage of eligible establishments that are considered respondents; that is, they did not refuse to participate in the study.

The data in Exhibit E-1 reveal that the final unweighted response rate for establishments was 77.8%. The final eligibility rate was 81.2%.<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 (87.0%) and the lowest eligibility rate occurring at the verification stage (85.5%). These results are intuitive for the following reasons:

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

**Census Division.** Establishments in the West North Central region (81.8%) had the highest significant final response rate, whereas the Middle Atlantic region (75.0%) had the lowest significant final response rate.

**Total Employees in Establishment.** For establishments with 1 to 5,000+ employees, a 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 other literature (e.g., Willimack, Nichols, & Sudman, 2002).

**SIC Division.** Comparing the different SIC divisions with the overall final response rate, one sees that Public Administration (91.8%) had the highest significant final response rate, whereas the Finance, Insurance, and Real Estate (65.8%) industry had the lowest significant final response rate. Response rate patterns by industry were highly dependent on the occupations included in a particular collection of

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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.

occupations; therefore, these findings would not necessarily apply to a different set of occupations in another analysis cycle.

**NAICS Sector.** Comparing the different NAICS sectors to the overall final response rate, one sees that Public Administration (91.7%) had the highest significant final response rate, and Finance and Insurance (65.8%) had the lowest significant final response rate. Response rate patterns by industry 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 another analysis cycle.

**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 (80.6%, as opposed to 77.8%), and establishments with 10 occupations on the sampling list had the lowest significant final response rate (66.5%). A decreasing trend in response rates appears to be generally correlated with an increase in the number of occupations on the establishment sampling list.

**Time Zone.** Establishments in the Alaska Standard Time zone had the highest significant final response rate (87.9%) compared to the overall rate, whereas establishments in the Pacific Standard Time zone had the lowest significant final response rate (75.6%).

**Metropolitan Status.** Rural establishments had a final response rate significantly higher than the overall response rate (83.6%, as opposed to 77.8%), whereas urban establishments had a significantly lower final response rate (76.3%).

## E.2.2 Comparison of Establishment Respondents and Nonrespondents

Exhibit E-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 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 if 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: 87.3% of the attributes had an absolute difference of less than 1 percentage point, 9.5% had an absolute difference of 1–2 percentage points, and 3.2% had an absolute difference of 2–3 percentage points.<sup>6</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:

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<sup>6</sup> Absolute difference is the absolute value of the final column of Exhibit E-2.

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

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.

Utilizing 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 Exhibit E-2, all of the effect sizes were small, with the largest effect size being equal to 0.08 for NAICS Sector and SIC Division. 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.

### E.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.

Exhibits E-3 and E-4, respectively, display the unweighted response rates for employees, and a comparison of the distribution of respondents and nonrespondents across various employee attributes from Establishment Method data collection for occupations published in Analysis Cycles 13–15.<sup>7</sup>

In addition to the categories displayed in Exhibits E-1 and E-2, Exhibits E-3 and E-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.

<sup>7</sup> Unweighted rates were used because appropriate weights were not available for nonresponding employees.



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 were likely to be related<sup>8</sup> to the primary outcome variables of the O\*NET Program.

### E.3.1 Employee Final Unweighted Response Rates

An estimate of the second source of nonresponse bias can be found in Exhibit E-3 under the column headed *Response Rate*. As discussed in Section E-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 West North Central region had a response rate significantly higher than the overall response rate (66.6% vs 63.8%), whereas employees in the Pacific region had a response rate significantly lower than the overall response rate (61.1% vs 63.8%).

**Total Employees in Establishment.** The response rate for employees from establishments with 1–4 employees had the highest significant response rate (72.6%) compared with the overall response rate (63.8%). The lowest significant response rate was for employees from establishments with 1,000–4,999 employees (57.7%).

**SIC Division.** Employees in the Agriculture, Forestry, Fishing and Hunting industry had the highest significant response rate (72.7%). Employees from the Services industry had the lowest significant response rate (61.4%).

**NAICS Sector.** Employees in the Agriculture, Forestry, Fishing, and Hunting sector had the highest significant response rate (73.0%).<sup>10</sup> Employees in the Accommodation and Food Services sector had the lowest significant response rate (52.7%).

**Total Selected Employees in Establishment.** The highest significant response rate was for employees from establishments with only 1 selected employee (73.4%). The lowest significant response rate was for employees from establishments with 17 employees selected (48.5%).

**Questionnaire Type.** The Work Context questionnaire had a significantly higher response rate (66.1%) than the overall response rate of 63.8%. The Work Activities questionnaire had the lowest significant response rate (62.0%).

**Number of Standard Occupational Classifications on Establishment Sampling List.** Establishments that had 1–5 occupations on the sampling list had the highest significant response rate (66.2%). Establishments that had 9 occupations on the sampling list had the lowest significant response rate (58.0%).

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<sup>8</sup> Based on logistic regression modeling results of both establishment-level and employee-level response propensity.

<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.

<sup>10</sup> The response rate for NAICS Sector Management of Companies and Enterprises was 100%, but because only one employee was sampled, this was not considered a reliable estimate.

**Occupational Class.** Business and Financial Operations Occupations had a significantly higher response rate (78.2%) than the overall response rate (63.8%). Food Preparation and Serving Related Occupations had the lowest significant response rate (53.4%).

**Time Zone.** The response rate in Pacific Standard Time was significantly lower than the overall response rate (60.9% vs 63.8%).

**Metropolitan Status.** The response rate for employees in a rural area was significantly higher than the overall response rate (67.3% vs 63.8%), and the response rate for employees in an urban area was significantly lower (62.8%).

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

Exhibit E-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. *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 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 employee nonresponse, the differences between respondents and the overall sample do not appear to be meaningful; for example, 89.8% of the attributes had an absolute difference of less than 1 percentage point,<sup>11</sup> 9.3% had an absolute difference of 1–2 percentage points, and 0.9% had an absolute difference of 2–3 percentage points.

Another measure of potential nonresponse bias is the effect size, as defined by Cohen (1988). See Section E.2 for a full explanation. The combination of small absolute differences and very small effect sizes indicates a low likelihood of bias due to employee nonresponse.

## E.4 Item Nonresponse

Exhibits E-5 through E-11 display unweighted item response rates by item, item type, and occupation for Establishment Method data included in Analysis Cycles 13–15. These tables include questionnaire data from employee respondents in the occupations published in Analysis Cycles 13–15 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 unanswered).

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<sup>11</sup> Absolute value of the final column in Exhibit E-4.

**Work Activities, Work Context, and Knowledge.** The data in Exhibits E-5 through E-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 93.9% for Work Activities Questionnaire Item 40 (Level), 97.6% for Work Context Questionnaire Item 49, and 85.3% for Knowledge Questionnaire Item 26 (Level). In addition, as seen in Exhibit E-10, item nonresponse is slightly more prevalent for Level items than for Importance items, regardless of questionnaire type.

**Occupation-Specific Tasks.** It appears from Exhibit E-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., 53-7062.00, Laborers and Freight, Stock, and Material Movers, Hand accounted for 6 of the top 10 lowest item completion 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. Most of the Frequency and Importance items with a low response rate were suppressed from publication because they were also found to be not relevant to the occupation (i.e., too few respondents rated the task as relevant).

**Background Questionnaire.** In Exhibit E-9, the item response rates appear to be nearly constant and high (nearly 94% or greater), with the exception of Item 4 (88.1%), which elicits information from the respondent about working in a family business.

**Item Type.** All the response rates by item type were 96.2% or higher (Exhibit E-10).

**Occupation.** Item response rates are provided in Exhibit E-11 for all occupations completed in Analysis Cycles 13–15. The overall item response rate was 97.9%, with the lowest response rate, 93.5%, coming from Construction Laborers (occupation code 47-2061.00). The highest response rate, 99.7%, came from Quality Control Systems Managers (occupation code 11-3051.51).

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

## E.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.

### Exhibit E-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>	45,898	85.5	98.1	98.0	94.0	99.5	87.0	99.9	96.6	81.2	77.8
<b>Census Division</b>											
New England	2,734	86.0	98.2	98.1	93.5	99.6	88.1	99.8	97.1	81.9	78.8
Middle Atlantic	6,776	86.1	97.8	97.9	92.9*	99.3	85.2*	99.9	96.5	81.3	75.0*
East North Central	6,624	86.6*	98.5*	98.1	93.5	99.4	87.0	99.9	96.4	82.5*	77.3
West North Central	3,712	88.1*	98.8*	98.0	95.7*	99.5	89.3*	99.9	96.7	84.4*	81.8*
South Atlantic	7,137	84.4*	98.0	98.0	94.8*	99.4	87.0	100.0	97.1	80.0*	78.9
East South Central	2,120	85.5	98.1	98.1	95.2*	99.5	87.2	99.9	95.4*	80.9	78.2
West South Central	4,387	84.6	98.1	98.2	94.1	99.3	87.1	100.0	96.2	80.4	77.5
Mountain	3,442	83.7*	98.1	98.2	96.0*	99.6	88.4*	99.9	96.4	79.9	80.6*
Pacific	7,738	84.6*	97.6*	97.9	92.7*	99.7*	86.1	100.0	96.9	80.3	75.8*
<b>Total Employees in Establishment</b>											
Unknown	1,555	80.1*	98.7*	95.9*	96.9*	99.2	91.4*	100.0*	97.4	73.9*	85.3*
1–4	6,619	66.7*	92.5*	96.2*	94.7	99.3	91.1*	100.0*	99.2*	59.7*	82.0*
5–9	2,870	84.0*	97.9	96.8*	95.1*	99.2	85.8	100.0*	98.6*	78.9*	79.0
10–49	11,379	85.7	98.3	98.4*	94.5	99.6	88.3*	100.0	98.0*	81.7	80.7*
50–99	7,189	89.8*	98.8*	98.4*	94.4	99.6	88.2*	100.0	96.2	86.5*	79.1*
100–249	4,513	91.7*	99.3*	98.6*	94.3	99.6	87.2	99.9	95.3*	88.8*	77.5
250–499	5,728	92.0*	99.4*	98.5*	92.6*	99.4	84.3*	99.8	94.6*	89.1*	72.9*
500–999	2,567	92.9*	99.2*	98.8*	92.6*	99.2	82.9*	99.7	94.6*	90.2*	71.6*
1,000–4,999	2,144	93.1*	99.1*	97.7	91.3*	99.5	79.2*	100.0*	93.0*	89.7*	66.2*
5,000+	106	96.2*	98.0	100.0	88.9	98.9	68.6*	100.0*	89.7	95.1*	53.1*
<b>SIC Division</b>											
Agriculture, Forestry, Fishing	1,327	75.1*	97.4	96.6*	94.1	99.5	84.7	100.0*	98.2*	71.6*	75.9
Mining	324	88.0	98.2	98.5	92.9	99.6	88.3	100.0*	94.3	84.6	76.4
Construction	3,188	75.6*	94.7*	97.3	93.4	99.4	79.3*	99.9	94.3*	69.9*	66.1*
Manufacturing	7,638	85.7	98.4	98.3	92.3*	99.7*	86.4	99.9	95.1*	82.3*	74.7*
Transportation, Communication, Electric, Gas, and Sanitary Services	4,075	85.0	98.4	97.8	93.7	99.5	87.4	100.0	96.4	80.9	77.5
Wholesale Trade	925	84.6	98.2	98.3	95.2	99.8*	87.2	100.0*	97.1	80.1	79.9
Retail Trade	2,621	89.2*	98.2	98.7*	90.5*	99.3	83.6*	99.9	95.6	85.9*	70.2*
Finance, Insurance, and Real Estate	1,981	84.0	98.1	97.6	85.4*	99.1	82.1*	100.0*	96.1	80.5	65.8*
Services	19,240	86.4*	98.1	98.0	95.3*	99.4	87.6	99.9	97.3*	81.5	80.4*
Public	3,351	91.4*	99.8*	98.5*	98.7*	99.7	95.0*	99.9	98.2*	88.9*	91.8*

(continued)

## Exhibit E-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	1,490	69.5*	96.4*	96.0*	95.4*	99.3	89.0	100.0*	98.1*	65.7*	80.2
Mining	320	87.5	98.6	98.5	92.4	99.6	87.2	100.0*	94.1	84.4	74.9
Utilities	1,174	89.0*	99.0*	97.3	94.5	99.2	90.2*	99.9	97.6	85.0*	82.3*
Construction	3,375	76.7*	94.9*	97.6	93.2	99.4	80.2*	99.9	94.8*	71.1*	67.5*
Manufacturing	6,473	87.1*	98.4	98.4	92.4*	99.7*	86.8	99.9	95.4*	83.6*	75.4*
Wholesale Trade	980	84.5	98.7	97.7	94.7	99.9*	86.7	100.0*	97.4	80.0	79.3
Retail Trade	2,507	88.0*	97.7	98.6*	90.0*	99.5	83.5*	99.9	95.3*	85.0*	69.8*
Transportation and Warehousing	1,863	83.0*	97.7	98.0	94.8	99.3	86.1	99.9	95.7	78.5*	76.0
Information	798	85.1	97.3	98.6	94.1	99.8	88.7	100.0*	98.0	79.5	80.1
Finance and Insurance	2,010	84.0	97.9	97.7	85.4*	99.2	81.7*	100.0*	96.5	80.5	65.8*
Real Estate and Rental and Leasing	349	89.1*	98.1	98.2	97.9*	99.6	89.1	100.0*	95.6	84.0	83.2*
Professional, Scientific, and Technical Services	3,560	80.6*	96.7*	98.2	94.8	99.4	90.4*	100.0*	98.0*	75.9*	82.7*
Management of Companies and Enterprises	20	90.0	100.0*	94.4	88.2	100.0*	93.3	100.0*	100.0*	85.0	82.4
Administrative and Support and Waste Management and Remediation Services	1,224	82.4*	97.6	97.6	93.5	99.9*	88.5	100.0*	96.9	76.9*	78.8
Educational Services	2,111	93.6*	99.7*	97.5	98.0*	99.4	92.1*	99.6*	98.2*	89.4*	88.3*
Health Care and Social Assistance	9,702	88.2*	98.8*	98.1	94.7*	99.3	85.2*	99.9	96.5	83.8*	77.2
Arts, Entertainment, and Recreation	561	84.1	96.2*	97.5	94.9	99.2	80.1*	100.0*	93.0*	77.7*	70.3*
Accommodation and Food Services	962	90.2*	99.0*	98.6	94.3	99.2	86.8	99.8	97.6	85.1*	78.4
Other Services, Except Public Administration	2,059	82.5*	97.3	97.9	94.1	99.8*	86.9	99.9	97.5	77.8*	78.1
Public Administration	3,132	91.4*	99.7*	98.4	98.8*	99.7	94.7*	100.0	98.2*	88.7*	91.7*

(continued)

## Exhibit E-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	32,253	83.4*	97.5*	98.1	94.7*	99.5	88.8*	100.0	97.7*	78.7*	80.6*
6	1,872	89.7*	99.2*	98.6	92.9	99.6	87.9	99.7	96.5	87.1*	77.9
7	1,810	88.8*	99.8*	97.9	93.6	99.3	86.3	99.9	96.7	85.1*	77.5
8	1,168	91.0*	99.4*	98.3	94.1	99.1	88.8	99.9	95.8	87.8*	79.1
9	1,043	88.3*	99.6*	97.3	92.8	99.3	81.1*	100.0*	93.6*	84.0*	69.5*
10	6,524	91.8*	99.5*	97.7	91.6*	99.3	79.8*	99.9	92.0*	88.5*	66.5*
<b>Time Zone</b>											
Eastern Standard Time	20,893	85.5	98.1	97.9	93.8	99.4	86.7	99.9	96.9	80.9	77.5
Central Standard Time	12,212	86.5*	98.4*	98.2	94.5	99.4	87.4	99.9	96.1*	82.6*	78.3
Mountain Standard Time	3,340	84.1*	98.0	98.4	96.1*	99.5	89.2*	99.9	96.3	80.4	81.2*
Pacific Standard Time	7,684	84.3*	97.5*	97.8	92.7*	99.7*	85.9*	100.0	96.9	80.0*	75.6*
Alaska Standard Time	297	88.6	99.6*	98.4	96.0	99.6	93.0*	100.0*	98.6*	85.7*	87.9*
Hawaii Standard Time	244	80.7	98.0	98.9	93.5	98.8	86.8	100.0*	95.6	76.0	76.6
<b>Metropolitan Status</b>											
Rural	8,447	86.5*	98.6*	98.4*	96.6*	99.6	90.3*	99.9	96.9	83.1*	83.6*
Urban	36,223	85.2	97.9	97.9	93.4*	99.4	86.2*	99.9	96.6	80.7	76.3*

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. All establishments are considered to be eligible at the verification stage. At subsequent stages, 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 two or more establishments. SIC = Standard Industrial Classification. NAICS = North American Industry Classification System.

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

## Exhibit E-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>	25,976	100.0	7,433	100.0	33,409	100.0	-	-
<b>Census Division</b> (effect size = 0.03)								
New England	1,632	6.3	439	5.9	2,071	6.2	0.4	0.1
Middle Atlantic	3,769	14.5	1,257	16.9	5,026	15.0	-2.4	-0.5
East North Central	3,876	14.9	1,138	15.3	5,014	15.0	-0.4	-0.1
West North Central	2,370	9.1	528	7.1	2,898	8.7	2.0	0.4
South Atlantic	4,152	16.0	1,110	14.9	5,262	15.8	1.1	0.2
East South Central	1,230	4.7	343	4.6	1,573	4.7	0.1	0.0
West South Central	2,518	9.7	730	9.8	3,248	9.7	-0.1	-0.0
Mountain	2,069	8.0	498	6.7	2,567	7.7	1.3	0.3
Pacific	4,360	16.8	1,390	18.7	5,750	17.2	-1.9	-0.4
<b>Total Employees in Establishment</b> (effect size =0.06 )								
Unknown	898	3.5	155	2.1	1,053	3.2	1.4	0.3*
1-4	3,104	11.9	683	9.2	3,787	11.3	2.8	0.6*
5-9	1,674	6.4	444	6.0	2,118	6.3	0.5	0.1
10-49	6,845	26.4	1,640	22.1	8,485	25.4	4.3	1.0*
50-99	4,497	17.3	1,188	16.0	5,685	17.0	1.3	0.3
100-249	2,820	10.9	818	11.0	3,638	10.9	-0.1	-0.0
250-499	3,395	13.1	1,260	17.0	4,655	13.9	-3.9	-0.9*
500-999	1,526	5.9	605	8.1	2,131	6.4	-2.3	-0.5*
1,000-4,999	1,165	4.5	594	8.0	1,759	5.3	-3.5	-0.8*
5,000+	52	0.2	46	0.6	98	0.3	-0.4	-0.1*
<b>SIC Division</b> (effect size =0.08 )								
Agriculture, Forestry, Fishing	706	2.7	224	3.0	930	2.8	-0.3	-0.1
Mining	198	0.8	61	0.8	259	0.8	-0.1	-0.0
Construction	1,355	5.2	694	9.3	2,049	6.1	-4.1	-0.9*
Manufacturing	4,384	16.9	1,487	20.0	5,871	17.6	-3.1	-0.7*
Transportation, Communication, Electric, Gas, and Sanitary Services	2,337	9.0	679	9.1	3,016	9.0	-0.1	-0.0
Wholesale Trade	535	2.1	135	1.8	670	2.0	0.2	0.1
Retail Trade	1,402	5.4	596	8.0	1,998	6.0	-2.6	-0.6*
Finance, Insurance, and Real Estate	998	3.8	518	7.0	1,516	4.5	-3.1	-0.7*
Services	11,523	44.4	2,812	37.8	14,335	42.9	6.5	1.5*
Public Administration	2,538	9.8	227	3.1	2,765	8.3	6.7	1.5*

(continued)

**Exhibit E-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</b> (effect size = 0.08)								
Agriculture, Forestry, Fishing, and Hunting	773	3.0	191	2.6	964	2.9	0.4	0.1
Mining	191	0.7	64	0.9	255	0.8	-0.1	-0.0
Utilities	783	3.0	168	2.3	951	2.8	0.8	0.2
Construction	1,493	5.7	719	9.7	2,212	6.6	-3.9	-0.9*
Manufacturing	3,757	14.5	1,229	16.5	4,986	14.9	-2.1	-0.5
Wholesale Trade	567	2.2	148	2.0	715	2.1	0.2	0.0
Retail Trade	1,384	5.3	599	8.1	1,983	5.9	-2.7	-0.6*
Transportation and Warehousing	1,000	3.8	316	4.3	1,316	3.9	-0.4	-0.1
Information	432	1.7	107	1.4	539	1.6	0.2	0.0
Finance and Insurance	1,020	3.9	531	7.1	1,551	4.6	-3.2	-0.7*
Real Estate and Rental and Leasing	218	0.8	44	0.6	262	0.8	0.2	0.1
Professional, Scientific, and Technical Services	2,124	8.2	443	6.0	2,567	7.7	2.2	0.5*
Management of Companies and Enterprises	14	0.1	3	0.0	17	0.1	0.0	0.0
Administrative and Support and Waste Management and Remediation Services	667	2.6	179	2.4	846	2.5	0.2	0.0
Educational Services	1,540	5.9	204	2.7	1,744	5.2	3.2	0.7*
Health Care and Social Assistance	5,708	22.0	1,687	22.7	7,395	22.1	-0.7	-0.2
Arts, Entertainment, and Recreation	293	1.1	124	1.7	417	1.2	-0.5	-0.1
Accommodation and Food Services	519	2.0	143	1.9	662	2.0	0.1	0.0
Other Services, Except Public Administration	1,144	4.4	321	4.3	1,465	4.4	0.1	0.0
Public Administration	2,349	9.0	213	2.9	2,562	7.7	6.2	1.4*
<b>Number of Occupations on Establishment Sampling List</b> (effect size = 0.07 )								
1-5	18,735	72.1	4,499	60.5	23,234	69.5	11.6	2.6*
6	1,198	4.6	340	4.6	1,538	4.6	0.0	0.0
7	1,093	4.2	317	4.3	1,410	4.2	-0.1	-0.0
8	755	2.9	199	2.7	954	2.9	0.2	0.1
9	555	2.1	243	3.3	798	2.4	-1.1	-0.3*
10	3,640	14.0	1,835	24.7	5,475	16.4	-10.7	-2.4*

(continued)



**Exhibit E-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 =0.02 )								
Eastern Standard Time	12,030	46.3	3,488	46.9	15,518	46.4	-0.6	-0.1
Central Standard Time	7,271	28.0	2,017	27.1	9,288	27.8	0.9	0.2
Mountain Standard Time	2,036	7.8	470	6.3	2,506	7.5	1.5	0.3
Pacific Standard Time	4,298	16.5	1,389	18.7	5,687	17.0	-2.1	-0.5
Alaska Standard Time	210	0.8	29	0.4	239	0.7	0.4	0.1
Hawaii Standard Time	131	0.5	40	0.5	171	0.5	-0.0	-0.0
<b>Metropolitan Status</b> (effect size =0.04 )								
Rural	5,486	21.1	1,079	14.5	6,565	19.7	6.6	1.5*
Urban	20,490	78.9	6,354	85.5	26,844	80.3	-6.6	-1.5*

Note: Because of rounding, the difference columns may not match their constituent parts. Statistical tests were conducted only for 2 or more establishments. NA = not applicable. SIC = Standard Industrial Classification. NAICS = North American Industry Classification System.

\*Statistically different from zero at the 0.05 level.

## Exhibit E-3. Unweighted Employee Response Rates

Category	Sampled	Response Rate
<b>Total</b>	37,639	63.8
<b>Census Division</b>		
New England	2,269	63.4
Middle Atlantic	4,936	63.4
East North Central	6,037	64.3
West North Central	4,064	66.6*
South Atlantic	6,549	63.9
East South Central	1,839	66.7
West South Central	3,788	62.1
Mountain	3,062	65.3
Pacific	5,095	61.1*
<b>Total Employees in Establishment</b>		
Unknown	1,142	57.9*
1–4	1,484	72.6*
5–9	1,399	70.8*
10–49	7,307	65.7*
50–99	6,505	65.9
100–249	5,142	64.7
250–499	7,616	62.5
500–999	3,388	59.6*
1,000–4,999	3,513	57.7*
5,000+	143	54.5
<b>SIC Division</b>		
Agriculture, Forestry, Fishing	813	72.7*
Mining	242	67.4
Construction	2,443	61.6
Manufacturing	7,394	67.0*
Transportation, Communication, Electric, Gas, and Sanitary Services	3,922	64.9
Wholesale Trade	620	62.7
Retail Trade	1,717	63.0
Finance, Insurance, and Real Estate	734	67.7
Services	16,816	61.4*
Public Administration	2,938	67.3*
<b>NAICS Sector</b>		
Agriculture, Forestry, Fishing, and Hunting	619	73.0*
Mining	236	66.1
Utilities	1,294	68.5*
Construction	2,515	61.0
Manufacturing	6,112	67.8*
Wholesale Trade	713	61.9

(continued)

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

<b>Category</b>	<b>Sampled</b>	<b>Response Rate</b>
Retail Trade	1,607	66.6
Transportation and Warehousing	2,073	61.7
Information	341	66.9
Finance and Insurance	890	64.6
Real Estate and Rental and Leasing	237	67.1
Professional, Scientific, and Technical Services	2,165	68.0*
Management of Companies and Enterprises	1	100.0
Administrative and Support and Waste Management and Remediation Services	584	64.2
Educational Services	1,872	65.8
Health Care and Social Assistance	10,836	58.6*
Arts, Entertainment, and Recreation	592	65.0
Accommodation and Food Services	986	52.7*
Other Services, Except Public Administration	1,280	72.7*
Public Administration	2,686	68.6*
<b>Total Selected Employees in Establishment</b>		
1	2,379	73.4*
2	2,500	68.7*
3	2,535	66.4
4	2,536	64.6
5	2,340	63.5
6	2,232	63.8
7	1,967	64.4
8	10,336	63.1
9	1,197	63.3
10	1,090	61.2
11	1,067	61.8
12	1,104	64.3
13	1,222	58.8
14	1,008	66.2
15	645	62.8
16	1,552	56.3*
17	425	48.5*
18	252	70.2
19	152	53.9
20	1,100	56.0*
<b>Questionnaire Type</b>		
Work Activities	12,883	62.0*
Work Context	12,004	66.1*
Knowledge	12,752	63.6

(continued)

## Exhibit E-3. Unweighted Employee Response Rates (continued)

Category	Sampled	Response Rate
<b>Number of Occupations on Establishment Sampling List</b>		
1-5	18,950	66.2*
6	1,864	63.5
7	1,609	64.6
8	1,441	58.9*
9	1,635	58.0*
10	12,140	61.4*
<b>Occupation Class</b>		
Management Occupations	2,106	71.0*
Business and Financial Operations Occupations	266	78.2*
Computer and Mathematical Occupations	404	65.1
Architecture and Engineering Occupations	1,872	68.9*
Life, Physical, and Social Science Occupations	2,043	65.7
Community and Social Services Occupations	1,212	68.2*
Legal Occupations	190	61.6
Education, Training, and Library Occupations	252	73.0*
Arts, Design, Entertainment, Sports, and Media Occupations	452	68.1
Healthcare Practitioners and Technical Occupations	7,208	58.4*
Healthcare Support Occupations	2,370	57.8*
Protective Service Occupations	850	68.1
Food Preparation and Serving Related Occupations	873	53.4*
Building and Grounds Cleaning and Maintenance Occupations	421	61.3
Personal Care and Service Occupations	1,177	66.9
Sales and Related Occupations	966	62.9
Office and Administrative Support Occupations	3,199	69.2*
Farming, Fishing, and Forestry Occupations	561	66.7
Construction and Extraction Occupations	2,381	62.3
Installation, Maintenance, and Repair Occupations	2,705	64.3
Production Occupations	3,377	67.3*
Transportation and Material Moving Occupations	2,754	59.3*
<b>Time Zone</b>		
Eastern Standard Time	17,641	64.3
Central Standard Time	11,424	63.9
Mountain Standard Time	3,098	65.0
Pacific Standard Time	5,055	60.9*
Alaska Standard Time	275	68.0
Hawaii Standard Time	146	71.9

(continued)

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

Category	Sampled	Response Rate
<b>Metropolitan Status</b>		
Rural	8,791	67.3*
Urban	28,848	62.8*

Note: Statistical tests conducted only for 2 or more employees. NA = not applicable, SIC = Standard Industrial Classification. NAICS = North American Classification System.

\*Statistically different from the total category.

## Exhibit E-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>	24,027	100.0	13,612	100.0	37,639	100.0	-	-
<b>Census Division</b> (effect size = 0.03)								
New England	1,439	6.0	830	6.1	2,269	6.0	-0.1	-0.0
Middle Atlantic	3,128	13.0	1,808	13.3	4,936	13.1	-0.3	-0.1
East North Central	3,880	16.1	2,157	15.8	6,037	16.0	0.3	0.1
West North Central	2,706	11.3	1,358	10.0	4,064	10.8	1.3	0.5*
South Atlantic	4,184	17.4	2,365	17.4	6,549	17.4	0.0	0.0
East South Central	1,226	5.1	613	4.5	1,839	4.9	0.6	0.2
West South Central	2,352	9.8	1,436	10.5	3,788	10.1	-0.8	-0.3
Mountain	2,000	8.3	1,062	7.8	3,062	8.1	0.5	0.2
Pacific	3,112	13.0	1,983	14.6	5,095	13.5	-1.6	-0.6*
<b>Total Employees in Establishment</b> (effect size = 0.06)								
Unknown	661	2.8	481	3.5	1,142	3.0	-0.8	-0.3*
1-4	1,077	4.5	407	3.0	1,484	3.9	1.5	0.5*
5-9	991	4.1	408	3.0	1,399	3.7	1.1	0.4*
10-49	4,800	20.0	2,507	18.4	7,307	19.4	1.6	0.6*
50-99	4,287	17.8	2,218	16.3	6,505	17.3	1.5	0.6*
100-249	3,327	13.8	1,815	13.3	5,142	13.7	0.5	0.2
250-499	4,758	19.8	2,858	21.0	7,616	20.2	-1.2	-0.4
500-999	2,020	8.4	1,368	10.0	3,388	9.0	-1.6	-0.6*
1,000-4,999	2,028	8.4	1,485	10.9	3,513	9.3	-2.5	-0.9*
5,000+	78	0.3	65	0.5	143	0.4	-0.2	-0.1
<b>SIC Division</b> (effect size = 0.04)								
Agriculture, Forestry, Fishing	591	2.5	222	1.6	813	2.2	0.8	0.3*
Mining	163	0.7	79	0.6	242	0.6	0.1	0.0
Construction	1,505	6.3	938	6.9	2,443	6.5	-0.6	-0.2
Manufacturing	4,954	20.6	2,440	17.9	7,394	19.6	2.7	1.0*
Transportation, Communication, Electric, Gas, and Sanitary Services	2,547	10.6	1,375	10.1	3,922	10.4	0.5	0.2
Wholesale Trade	389	1.6	231	1.7	620	1.6	-0.1	-0.0
Retail Trade	1,082	4.5	635	4.7	1,717	4.6	-0.2	-0.1
Finance, Insurance, and Real Estate	497	2.1	237	1.7	734	2.0	0.3	0.1
Services	10,323	43.0	6,493	47.7	16,816	44.7	-4.7	-1.7*
Public Administration	1,976	8.2	962	7.1	2,938	7.8	1.2	0.4*

(continued)

**Exhibit E-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</b> (effect size = 0.07)								
Agriculture, Forestry, Fishing, and Hunting	452	1.9	167	1.2	619	1.6	0.7	0.2*
Mining	156	0.6	80	0.6	236	0.6	0.1	0.0
Utilities	886	3.7	408	3.0	1,294	3.4	0.7	0.2*
Construction	1,533	6.4	982	7.2	2,515	6.7	-0.8	-0.3
Manufacturing	4,141	17.2	1,971	14.5	6,112	16.2	2.8	1.0*
Wholesale Trade	441	1.8	272	2.0	713	1.9	-0.2	-0.1
Retail Trade	1,070	4.5	537	3.9	1,607	4.3	0.5	0.2
Transportation and Warehousing	1,279	5.3	794	5.8	2,073	5.5	-0.5	-0.2
Information	228	0.9	113	0.8	341	0.9	0.1	0.0
Finance and Insurance	575	2.4	315	2.3	890	2.4	0.1	0.0
Real Estate and Rental and Leasing	159	0.7	78	0.6	237	0.6	0.1	0.0
Professional, Scientific, and Technical Services	1,473	6.1	692	5.1	2,165	5.8	1.0	0.4*
Management of Companies and Enterprises	1	0.0	0	0.0	1	0.0	0.0	0.0
Administrative and Support and Waste Management and Remediation Services	375	1.6	209	1.5	584	1.6	0.0	0.0
Educational Services	1,231	5.1	641	4.7	1,872	5.0	0.4	0.1
Health Care and Social Assistance	6,349	26.4	4,487	33.0	10,836	28.8	-6.5	-2.4*
Arts, Entertainment, and Recreation	385	1.6	207	1.5	592	1.6	0.1	0.0
Accommodation and Food Services	520	2.2	466	3.4	986	2.6	-1.3	-0.5*
Other Services, Except Public Administration	930	3.9	350	2.6	1,280	3.4	1.3	0.5*
Public Administration	1,843	7.7	843	6.2	2,686	7.1	1.5	0.5*

(continued)

**Exhibit E-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</b> (effect size = 0.06)								
1	1,746	7.3	633	4.7	2,379	6.3	2.6	0.9*
2	1,717	7.1	783	5.8	2,500	6.6	1.4	0.5*
3	1,683	7.0	852	6.3	2,535	6.7	0.7	0.3
4	1,639	6.8	897	6.6	2,536	6.7	0.2	0.1
5	1,486	6.2	854	6.3	2,340	6.2	-0.1	-0.0
6	1,424	5.9	808	5.9	2,232	5.9	-0.0	-0.0
7	1,267	5.3	700	5.1	1,967	5.2	0.1	0.0
8	6,525	27.2	3,811	28.0	10,336	27.5	-0.8	-0.3
9	758	3.2	439	3.2	1,197	3.2	-0.1	-0.0
10	667	2.8	423	3.1	1,090	2.9	-0.3	-0.1
11	659	2.7	408	3.0	1,067	2.8	-0.3	-0.1
12	710	3.0	394	2.9	1,104	2.9	0.1	0.0
13	719	3.0	503	3.7	1,222	3.2	-0.7	-0.3
14	667	2.8	341	2.5	1,008	2.7	0.3	0.1
15	405	1.7	240	1.8	645	1.7	-0.1	-0.0
16	874	3.6	678	5.0	1,552	4.1	-1.3	-0.5*
17	206	0.9	219	1.6	425	1.1	-0.8	-0.3*
18	177	0.7	75	0.6	252	0.7	0.2	0.1
19	82	0.3	70	0.5	152	0.4	-0.2	-0.1
20	616	2.6	484	3.6	1,100	2.9	-1.0	-0.4*
<b>Questionnaire Type</b> (effect size = 0.03)								
Work Activities	7,984	33.2	4,899	36.0	12,883	34.2	-2.8	-1.0*
Work Context	7,937	33.0	4,067	29.9	12,004	31.9	3.2	1.1*
Knowledge	8,106	33.7	4,646	34.1	12,752	33.9	-0.4	-0.1
<b>Number of Occupations on Establishment Sampling List</b> (effect size =0.04)								
1-5	12,550	52.2	6,400	47.0	18,950	50.3	5.2	1.9*
6	1,184	4.9	680	5.0	1,864	5.0	-0.1	-0.0
7	1,039	4.3	570	4.2	1,609	4.3	0.1	0.0
8	849	3.5	592	4.3	1,441	3.8	-0.8	-0.3*
9	948	3.9	687	5.0	1,635	4.3	-1.1	-0.4*
10	7,457	31.0	4,683	34.4	12,140	32.3	-3.4	-1.2*

(continued)



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

Category	Respondents		Nonrespondents		Overall		Percent Difference Resp vs. Nonresps	Percent Difference Resp vs. Overall
	No.	%	No.	%	No.	%		
<b>Occupation Class (effect size = 0.08)</b>								
Management Occupations	1,495	6.2	611	4.5	2,106	5.6	1.7	0.6*
Business and Financial Operations Occupations	208	0.9	58	0.4	266	0.7	0.4	0.2*
Computer and Mathematical Occupations	263	1.1	141	1.0	404	1.1	0.1	0.0
Architecture and Engineering Occupations	1,289	5.4	583	4.3	1,872	5.0	1.1	0.4*
Life, Physical, and Social Science Occupations	1,343	5.6	700	5.1	2,043	5.4	0.4	0.2
Community and Social Services Occupations	827	3.4	385	2.8	1,212	3.2	0.6	0.2*
Legal Occupations	117	0.5	73	0.5	190	0.5	-0.0	-0.0
Education, Training, and Library Occupations	184	0.8	68	0.5	252	0.7	0.3	0.1*
Arts, Design, Entertainment, Sports, and Media Occupations	308	1.3	144	1.1	452	1.2	0.2	0.1
Healthcare Practitioners and Technical Occupations	4,207	17.5	3,001	22.0	7,208	19.2	-4.5	-1.6*
Healthcare Support Occupations	1,371	5.7	999	7.3	2,370	6.3	-1.6	-0.6*
Protective Service Occupations	579	2.4	271	2.0	850	2.3	0.4	0.2
Food Preparation and Serving Related Occupations	466	1.9	407	3.0	873	2.3	-1.1	-0.4*
Building and Grounds Cleaning and Maintenance Occupations	258	1.1	163	1.2	421	1.1	-0.1	-0.0
Personal Care and Service Occupations	788	3.3	389	2.9	1,177	3.1	0.4	0.2
Sales and Related Occupations	608	2.5	358	2.6	966	2.6	-0.1	-0.0
Office and Administrative Support Occupations	2,213	9.2	986	7.2	3,199	8.5	2.0	0.7*
Farming, Fishing, and Forestry Occupations	374	1.6	187	1.4	561	1.5	0.2	0.1
Construction and Extraction Occupations	1,484	6.2	897	6.6	2,381	6.3	-0.4	-0.1
Installation, Maintenance, and Repair Occupations	1,740	7.2	965	7.1	2,705	7.2	0.2	0.1

(continued)

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

Category	Respondents		Nonrespondents		Overall		Percent Difference Resp vs. Nonresps	Percent Difference Resp vs. Overall
Production Occupations	2,272	9.5	1,105	8.1	3,377	9.0	1.3	0.5*
Transportation and Material Moving Occupations	1,633	6.8	1,121	8.2	2,754	7.3	-1.4	-0.5*
<b>Time Zone</b> (effect size =0.02)								
Eastern Standard Time	11,348	47.2	6,293	46.2	17,641	46.9	1.0	0.4
Central Standard Time	7,297	30.4	4,127	30.3	11,424	30.4	0.1	0.0
Mountain Standard Time	2,013	8.4	1,085	8.0	3,098	8.2	0.4	0.1
Pacific Standard Time	3,077	12.8	1,978	14.5	5,055	13.4	-1.7	-0.6*
Alaska Standard Time	187	0.8	88	0.6	275	0.7	0.1	0.0
Hawaii Standard Time	105	0.4	41	0.3	146	0.4	0.1	0.0
<b>Metropolitan Status</b> (effect size =0.03)								
Rural	5,918	24.6	2,873	21.1	8,791	23.4	3.5	1.3*
Urban	18,109	75.4	10,739	78.9	28,848	76.6	-3.5	-1.3*

Notes: Because of rounding, the difference columns may not match their constituent parts. Statistical tests conducted only for two or more employees. NA = not applicable, NAICS = North American Classification System, SIC = Standard Industrial Classification.

\*Statistically different from zero at the 0.05 level.

**Exhibit E-5. Ten Lowest Item Completion Rates, Work Activities Questionnaire**

Item and Description		Sampled	Response Rate
B40-Level	Recruiting, interviewing, selecting, hiring, and promoting employees in an organization.	3,569	93.9
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.	3,524	95.1
B22-Level	Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.	3,897	95.7
B05-Level	Estimating sizes, distances, and quantities; or determining time, costs, resources, or materials needed to perform a work activity.	6,039	95.8
B32-Level	Performing for people or dealing directly with the public. This includes serving customers in restaurants and stores, and receiving clients or guests.	5,133	95.9
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.	3,901	96.0
B06-Level	Assessing the value, importance, or quality of things or people.	6,388	96.2
B41-Level	Monitoring and controlling resources and overseeing the spending of money.	4,963	96.2
B13-Level	Establishing long-range objectives and specifying the strategies and actions to achieve them.	5,949	96.4
B30-Level	Convincing others to buy merchandise/goods or to otherwise change their minds or actions.	4,524	96.4

**Exhibit E-6. Ten Lowest Item Completion Rates, Work Context Questionnaire**

<b>Item and Description</b>	<b>Sampled</b>	<b>Response Rate</b>
D49 How automated is the job?	7,284	97.6
D45 How serious would the result usually be if the worker made a mistake that was not readily correctable?	7,284	97.9
D09 How important is it to coordinate or lead others in accomplishing work activities in this job?	7,284	98.3
D12 How often are there conflict situations the employee has to face in this job?	7,284	98.4
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?	7,284	98.4
D39 How much does this job require keeping or regaining your balance?	7,284	98.5
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.)	7,284	98.6
D53 To what extent does this job require the worker to compete or to be aware of competitive pressures?	7,284	98.6
D11 How responsible is the worker for work outcomes and results of other workers?	7,284	98.6
D40 How much does this job require using your hands to handle, control, or feel objects, tools or controls?	7,284	98.6
D33 How often does this job require exposure to minor burns, cuts, bites, or stings?	7,284	98.7

\*11 items are shown because of ties in response rates.

**Exhibit E-7. Ten Lowest Item Completion Rates, Knowledge Questionnaire**

Item	Item Description	Sampled	Response Rate
E26-Level	Knowledge of the theory and techniques required to compose, produce, and perform works of music, dance, visual arts, drama, and sculpture.	872	85.3
E08-Level	Knowledge of techniques and equipment for planting, growing, and harvesting food products (both plant and animal) for consumption, including storage/handling techniques.	1,233	88.9
E27-Level	Knowledge of historical events and their causes, indicators, and effects on civilizations and cultures.	1,657	92.0
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.	2,591	94.6
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.	2,526	95.0
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.	2,902	95.4
E22-Level	Knowledge of principles, methods, and procedures for diagnosis, treatment, and rehabilitation of physical and mental dysfunctions, and for career counseling and guidance.	3,295	95.5
E17-Level	Knowledge of plant and animal organisms, their tissues, cells, functions, interdependencies, and interactions with each other and the environment.	3,042	95.9
E20-Level	Knowledge of principles and methods for describing the features of land, sea, and air masses, including their physical characteristics, locations, interrelationships, and distribution of plant, animal, and human life.	2,956	95.9
E19-Level	Knowledge of group behavior and dynamics, societal trends and influences, human migrations, ethnicity, cultures and their history and origins.	3,400	96.1

## Exhibit E-8. Ten Lowest Item Completion Rates, Task Questionnaire

Item	Item Description	Sampled	Response Rate
53-7062.00, Laborers and Freight, Stock, and Material Movers, Hand: T32-Importance	Lay tracks for camera dollies or cranes and carry or push dollies or cranes as instructed.	5	20.0
29-1069.02, Dermatologists: T10-Frequency	Provide liposuction treatment to patients.	11	36.4
53-7062.00, Laborers and Freight, Stock, and Material Movers, Hand: T30-Importance	Secure or release mooring lines of ships.	5	40.0
53-7062.00, Laborers and Freight, Stock, and Material Movers, Hand: T30-Frequency	Secure or release mooring lines of ships.	5	40.0
53-7062.00, Laborers and Freight, Stock, and Material Movers, Hand: T32-Frequency	Lay tracks for camera dollies or cranes and carry or push dollies or cranes as instructed.	5	40.0
49-3023.02, Automotive Specialty Technicians: T22-Frequency	Inspect propane or natural gas high-pressure tanks, piping, or pressure regulators.	14	42.9
53-7062.00, Laborers and Freight, Stock, and Material Movers, Hand: T12-Frequency	Sew canvas or other materials to make or repair tents, tarps, scrim, or backings, using sewing machines.	9	44.4
39-3012.00, Gaming and Sports Book Writers and Runners: T17-Frequency	Push dice to shooters and retrieve thrown dice.	10	50.0
49-3023.02, Automotive Specialty Technicians: T14-Frequency	Convert vehicle fuel systems from gasoline to butane gas, ethanol, methane, or other alternative or biofuel systems.	14	50.0
53-6051.01, Aviation Inspectors: T13-Importance	Issue pilots' licenses to individuals meeting standards.	2	50.0
53-6051.01, Aviation Inspectors: T13-Frequency	Issue pilots' licenses to individuals meeting standards.	2	50.0
49-3023.02, Automotive Specialty Technicians: T24-Frequency	Retrofit vehicle fuel systems with aftermarket products, such as vapor transfer devices, evaporation control devices, swirlers, lean burn devices, or friction reduction devices, to enhance combustion and fuel efficiency.	13	53.8
45-2011.00, Agricultural Inspectors: T21-Importance	Inspect livestock to determine effectiveness of medication or feeding programs.	11	54.5
45-2011.00, Agricultural Inspectors: T21-Frequency	Inspect livestock to determine effectiveness of medication or feeding programs.	11	54.5
53-7062.00, Laborers and Freight, Stock, and Material Movers, Hand: T12-Importance	Sew canvas or other materials to make or repair tents, tarps, scrim, or backings, using sewing machines.	9	55.6
47-2061.00, Construction Laborers: T19-Importance	Identify, pack, or transport hazardous or radioactive materials.	16	56.3

\* 16 items are shown due to ties among response rates.

**Exhibit E-9. Completion Rates, Background Questionnaire**

<b>Item and Description</b>	<b>Sampled</b>	<b>Response Rate</b>
2 How long at job?	21,991	99.3
3 Employment sector	21,991	97.0
4 Family business	21,991	88.1
5 Age group	21,991	96.1
6 Gender	21,991	98.3
7 Ethnicity	21,991	97.0
8 Race	21,991	94.1
9 Education level	21,991	99.1
<b>Items Added to Match the Disability Questions in the American Community</b>		
10 Deafness or serious difficulty hearing	542	98.7
11 Blind or serious difficulty seeing even when wearing glasses	542	98.9
12A Serious difficulty concentrating, remembering, or making decisions	542	98.9
12B Serious difficulty walking or climbing stairs	542	98.7
12C Difficulty dressing or bathing	542	98.3
13 Difficulty doing errands alone because of a physical, mental, or emotional condition	542	98.5
<b>Items Deleted to Match the Disability Questions in the American Community</b>		
9A Blindness, deafness, or other severe vision or hearing impairment	21,449	98.3
9B A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying	21,449	98.3
10A Difficulty learning, remembering, or concentrating	21,449	96.0
10B Difficulty bathing, or getting around inside the home	21,449	96.0
10C Difficulty going outside the home alone to shop or visit the doctor's office	21,449	96.0
10D Difficulty working at a job or business	21,449	95.9

**Exhibit E-10. Item Completion Rates by Item Type**

<b>Item Type</b>	<b>Questions</b>	<b>Response Rate</b>
TOTAL	2,926,281	97.9
B--Work Activities--Importance	299,300	98.8
B-Work--Activities--Level	242,399	97.0
D--Work Context	415,188	98.9
E--Knowledge--Education and Training	29,628	98.8
E--Knowledge--Importance	244,431	98.8
E--Knowledge--Level	138,289	96.9
E--Knowledge--Work Styles Background	118,512	99.2
Background	304,622	96.4
Task--Relevance	451,090	98.8
Task--Importance	341,411	97.1
Task--Frequency	341,411	96.2



## Exhibit E-11. Item Completion Rates by Occupation

Occupation Code	Occupation Title	Questions	Response Rate
<b>TOTAL</b>		2,926,281	97.9
11-1011.00	Chief Executives	13,816	99.2
11-3031.02	Financial Managers, Branch or Department	10,799	98.1
11-3051.51	Quality Control Systems Managers	9,443	99.7
11-3051.54	Biomass Power Plant Managers	18,295	98.8
11-3051.71	Industrial Production Managers	14,448	98.7
11-3071.81	Transportation Managers	14,652	97.9
11-9013.02	Farm and Ranch Managers	10,490	98.3
11-9041.51	Biofuels/Biodiesel Technology and Product Development Managers	12,497	98.6
11-9041.81	Architectural and Engineering Managers	16,934	98.5
11-9061.51	Funeral Service Managers	7,838	99.0
11-9071.00	Gaming Managers	11,966	98.0
11-9121.00	Natural Sciences Managers	8,721	98.8
11-9199.06	Spa Managers	8,422	97.8
11-9199.52	Compliance Managers	8,333	98.0
11-9199.53	Investment Fund Managers	10,528	98.6
11-9199.55	Online Merchants	11,871	97.2
13-1021.00	Buyers and Purchasing Agents, Farm Products	7,976	98.7
13-1071.51	Human Resources Specialists	18,107	98.6
15-1133.81	Software Developers, Systems Software	14,416	98.7
15-1152.00	Computer Network Support Specialists	17,999	98.0
17-2072.81	Electronics Engineers, Except Computer	12,270	99.2
17-2199.55	Mechatronics Engineers	8,884	98.7
17-2199.60	Wind Energy Engineers	13,323	98.6
17-3012.01	Electronic Drafters	6,883	99.1
17-3012.02	Electrical Drafters	17,839	97.9
17-3023.71	Electronics Engineering Technicians	10,282	98.8
17-3023.81	Electrical Engineering Technicians	11,306	98.2
17-3025.81	Environmental Engineering Technicians	11,400	98.1
17-3026.81	Industrial Engineering Technicians	9,577	98.0
17-3029.52	Electrical Engineering Technologists	10,273	98.4
17-3029.53	Electromechanical Engineering Technologists	6,554	98.5
17-3029.55	Industrial Engineering Technologists	8,375	98.8
17-3029.57	Mechanical Engineering Technologists	9,521	97.6

(continued)

**Exhibit E-11. Item Completion Rates by Occupation (continued)**

<b>Occupation Code</b>	<b>Occupation Title</b>	<b>Questions</b>	<b>Response Rate</b>
17-3031.02	Mapping Technicians	9,458	98.3
19-1029.01	Bioinformatics Scientists	10,841	98.6
19-1042.00	Medical Scientists, Except Epidemiologists	11,886	97.8
19-2031.81	Chemists	12,314	98.4
19-2041.71	Environmental Scientists and Specialists, Including Health	13,760	98.1
19-3031.02	Clinical Psychologists	9,250	99.1
19-3031.03	Counseling Psychologists	7,588	98.7
19-4011.02	Food Science Technicians	9,965	97.7
19-4011.81	Agricultural Technicians	12,394	98.4
19-4031.81	Chemical Technicians	10,912	97.9
19-4051.82	Nuclear Monitoring Technicians	15,779	97.9
19-4092.71	Forensic Science Technicians	13,176	99.0
19-4099.01	Bioinformatics Technicians	8,494	98.3
19-4099.51	Quality Control Analysts	16,676	98.2
19-4099.53	Remote Sensing Technicians	8,604	99.4
21-1011.71	Substance Abuse and Behavioral Disorder Counselors	18,425	98.1
21-1013.00	Marriage and Family Therapists	7,235	98.6
21-1014.71	Mental Health Counselors	15,653	98.8
21-1015.00	Rehabilitation Counselors	14,442	97.5
21-1023.71	Mental Health and Substance Abuse Social Workers	13,339	98.9
21-1091.00	Health Educators	9,797	98.8
21-1093.71	Social and Human Service Assistants	12,271	98.1
21-1094.00	Community Health Workers	8,831	97.4
23-1012.00	Judicial Law Clerks	13,956	99.0
25-1113.00	Social Work Teachers, Postsecondary	9,467	98.8
25-2023.00	Vocational Education Teachers, Middle School	19,733	98.8
27-1011.00	Art Directors	8,059	98.6
27-2012.03	Program Directors	10,624	99.3
27-3042.00	Technical Writers	10,554	98.6
27-3091.00	Interpreters and Translators	6,909	97.8
29-1011.71	Chiropractors	7,159	98.8
29-1021.71	Dentists, General	10,345	98.5
29-1022.00	Oral and Maxillofacial Surgeons	7,362	98.4
29-1023.00	Orthodontists	7,533	97.6

(continued)

**Exhibit E-11. Item Completion Rates by Occupation (continued)**

Occupation Code	Occupation Title	Questions	Response Rate
29-1024.00	Prosthodontists	6,181	98.0
29-1051.71	Pharmacists	16,275	98.4
29-1061.00	Anesthesiologists	13,556	98.4
29-1063.00	Internists, General	7,102	99.1
29-1065.00	Pediatricians, General	9,488	98.2
29-1066.71	Psychiatrists	12,587	97.7
29-1069.01	Allergists and Immunologists	7,997	99.0
29-1069.02	Dermatologists	8,285	98.0
29-1069.05	Neurologists	9,802	98.0
29-1069.07	Ophthalmologists	7,313	99.1
29-1069.09	Preventive Medicine Physicians	8,538	97.7
29-1069.11	Radiologists	10,285	98.8
29-1069.12	Sports Medicine Physicians	10,903	97.4
29-1069.13	Urologists	8,275	98.3
29-1123.71	Physical Therapists	20,008	98.6
29-1124.71	Radiation Therapists	14,763	98.7
29-1126.71	Respiratory Therapists	16,448	98.4
29-1127.71	Speech-Language Pathologists	13,222	97.6
29-1131.71	Veterinarians	11,435	98.1
29-1141.71	Registered Nurses	18,192	98.1
29-2011.71	Medical and Clinical Laboratory Technologists	13,504	98.9
29-2012.71	Medical and Clinical Laboratory Technicians	14,026	96.8
29-2021.71	Dental Hygienists	12,822	97.8
29-2031.71	Cardiovascular Technologists and Technicians	13,816	98.5
29-2032.71	Diagnostic Medical Sonographers	15,939	98.3
29-2033.71	Nuclear Medicine Technologists	17,304	98.5
29-2034.71	Radiologic Technologists	14,770	98.3
29-2041.71	Emergency Medical Technicians and Paramedics	15,373	98.9
29-2051.71	Dietetic Technicians	10,134	97.7
29-2052.71	Pharmacy Technicians	14,462	98.2
29-2053.71	Psychiatric Technicians	8,213	96.9
29-2054.71	Respiratory Therapy Technicians	12,322	97.9
29-2055.71	Surgical Technologists	11,569	98.3
29-2056.71	Veterinary Technologists and Technicians	12,595	98.2
29-2061.71	Licensed Practical and Licensed Vocational Nurses	19,985	97.2
29-2071.71	Medical Records and Health Information Technicians	16,790	97.4

(continued)

**Exhibit E-11. Item Completion Rates by Occupation (continued)**

Occupation Code	Occupation Title	Questions	Response Rate
29-2099.04	Hearing Instrument Specialists	6,546	97.9
29-2099.71	Radiologic Technicians	12,380	98.6
29-9091.71	Athletic Trainers	15,029	98.8
29-9099.02	Midwives	12,823	97.7
31-1011.71	Home Health Aides	14,327	96.9
31-1013.71	Psychiatric Aides	12,164	96.5
31-1014.00	Nursing Assistants	18,524	96.3
31-2011.71	Occupational Therapy Assistants	12,379	98.0
31-2012.00	Occupational Therapist Aides	5,846	97.9
31-2021.71	Physical Therapist Assistants	14,945	98.3
31-2022.71	Physical Therapist Aides	13,188	97.5
31-9091.71	Dental Assistants	12,047	97.0
31-9092.71	Medical Assistants	14,154	97.3
31-9093.71	Medical Equipment Preparers	9,591	96.8
31-9094.00	Medical Transcriptionists	9,036	98.6
31-9095.71	Pharmacy Aides	9,194	97.2
31-9096.71	Veterinary Assistants and Laboratory Animal Caretakers	11,727	98.1
31-9099.01	Anesthesiologist Assistants	7,444	98.1
33-1011.00	First-Line Supervisors of Correctional Officers	10,691	97.5
33-1021.02	Forest Fire Fighting and Prevention Supervisors	15,165	98.2
33-3021.05	Immigration and Customs Inspectors	9,288	98.7
33-3031.00	Fish and Game Wardens	15,254	98.7
33-3051.03	Sheriffs and Deputy Sheriffs	11,893	98.8
33-9099.52	Retail Loss Prevention Specialists	11,878	97.9
35-2012.00	Cooks, Institution and Cafeteria	16,233	95.5
35-3041.00	Food Servers, Nonrestaurant	10,186	97.2
35-9011.00	Dining Room and Cafeteria Attendants and Bartender Helpers	13,293	95.5
35-9021.00	Dishwashers	8,937	96.1
37-2011.00	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	13,258	93.5
37-2012.00	Maids and Housekeeping Cleaners	14,066	95.5
39-1011.00	Gaming Supervisors	13,081	98.1
39-2011.00	Animal Trainers	14,057	98.2
39-3012.00	Gaming and Sports Book Writers and Runners	10,716	97.0
39-4011.00	Embalmers	7,963	99.1
39-4021.00	Funeral Attendants	12,827	96.7

(continued)

## Exhibit E-11. Item Completion Rates by Occupation (continued)

Occupation Code	Occupation Title	Questions	Response Rate
39-5094.00	Skincare Specialists	11,288	97.9
39-6031.00	Flight Attendants	12,823	98.5
39-9021.71	Personal Care Aides	11,578	97.6
41-1012.00	First-Line Supervisors of Non-Retail Sales Workers	11,394	98.9
41-3031.02	Sales Agents, Financial Services	5,806	98.8
41-3099.51	Energy Brokers	8,154	98.6
41-4011.00	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	14,511	98.6
41-4011.57	Solar Sales Representatives and Assessors	8,877	98.6
41-4012.00	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	14,811	97.8
41-9031.00	Sales Engineers	9,363	96.6
43-2011.00	Switchboard Operators, Including Answering Service	16,360	96.6
43-3021.01	Statement Clerks	5,241	96.1
43-3021.02	Billing, Cost, and Rate Clerks	14,318	96.5
43-3041.00	Gaming Cage Workers	12,075	96.7
43-4011.00	Brokerage Clerks	5,610	98.0
43-4031.01	Court Clerks	9,821	98.0
43-4031.02	Municipal Clerks	9,588	97.8
43-4031.03	License Clerks	12,019	96.7
43-4051.81	Customer Service Representatives	11,387	98.2
43-4071.00	File Clerks	13,933	97.5
43-4111.71	Interviewers, Except Eligibility and Loan	10,545	98.4
43-4171.71	Receptionists and Information Clerks	17,855	97.6
43-4181.00	Reservation and Transportation Ticket Agents and Travel Clerks	8,508	97.9
43-5011.00	Cargo and Freight Agents	8,036	97.7
43-5011.51	Freight Forwarders	19,386	97.7
43-5032.81	Dispatchers, Except Police, Fire, and Ambulance	10,476	98.0
43-5061.00	Production, Planning, and Expediting Clerks	13,567	98.4
43-5071.81	Shipping, Receiving, and Traffic Clerks	14,628	98.1
43-6013.71	Medical Secretaries	13,870	97.8
43-6014.00	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	22,210	98.4
45-1011.05	First-Line Supervisors of Logging Workers	9,526	97.8
45-1011.07	First-Line Supervisors of Agricultural Crop and Horticultural Workers	11,183	97.5
45-2011.00	Agricultural Inspectors	11,879	96.5

(continued)

## Exhibit E-11. Item Completion Rates by Occupation (continued)

Occupation Code	Occupation Title	Questions	Response Rate
45-4011.00	Forest and Conservation Workers	9,945	97.7
47-1011.00	First-Line Supervisors of Construction Trades and Extraction Workers	16,845	97.6
47-1011.53	Solar Energy Installation Managers	8,341	98.3
47-2031.81	Construction Carpenters	17,215	97.3
47-2061.00	Construction Laborers	11,890	93.5
47-2073.00	Operating Engineers and Other Construction Equipment Operators	16,177	96.5
47-2111.71	Electricians	20,684	98.1
47-2121.00	Glaziers	10,224	96.7
47-2141.00	Painters, Construction and Maintenance	14,909	96.8
47-2152.81	Plumbers	9,788	97.9
47-2152.82	Pipe Fitters and Steamfitters	14,773	98.4
47-2211.81	Sheet Metal Workers	12,491	97.4
47-3011.00	Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	7,678	96.1
47-3012.00	Helpers--Carpenters	7,705	95.4
47-4099.51	Solar Photovoltaic Installers	10,011	97.9
47-5013.00	Service Unit Operators, Oil, Gas, and Mining	6,132	96.7
49-1011.71	First-Line Supervisors of Mechanics, Installers, and Repairers	19,932	97.9
49-2021.51	Radio, Cellular, and Tower Equipment Installers and Repairers	6,195	99.2
49-2094.81	Electrical and Electronics Repairers, Commercial and Industrial Equipment	15,561	97.9
49-3011.00	Aircraft Mechanics and Service Technicians	16,587	97.7
49-3022.00	Automotive Glass Installers and Repairers	6,442	97.1
49-3023.02	Automotive Specialty Technicians	14,465	96.5
49-3031.81	Bus and Truck Mechanics and Diesel Engine Specialists	16,112	97.1
49-3052.00	Motorcycle Mechanics	7,109	98.9
49-3093.00	Tire Repairers and Changers	11,673	98.3
49-9021.81	Heating and Air Conditioning Mechanics and Installers	24,432	97.6
49-9041.00	Industrial Machinery Mechanics	15,048	97.5
49-9051.00	Electrical Power-Line Installers and Repairers	10,356	97.9
49-9062.71	Medical Equipment Repairers	12,292	98.6
49-9071.81	Maintenance and Repair Workers, General	38,054	97.4
49-9099.52	Wind Turbine Service Technicians	9,688	98.4
51-2022.00	Electrical and Electronic Equipment Assemblers	8,492	97.0

(continued)

## Exhibit E-11. Item Completion Rates by Occupation (continued)

Occupation Code	Occupation Title	Questions	Response Rate
51-2031.00	Engine and Other Machine Assemblers	11,239	98.4
51-2041.00	Structural Metal Fabricators and Fitters	12,034	96.8
51-4011.00	Computer-Controlled Machine Tool Operators, Metal and Plastic	13,539	97.3
51-4032.00	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	10,403	98.1
51-4041.81	Machinists	18,505	97.7
51-4081.00	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	14,625	97.0
51-4111.00	Tool and Die Makers	10,872	98.0
51-4121.06	Welders, Cutters, and Welder Fitters	17,982	97.6
51-5112.00	Printing Press Operators	9,678	97.2
51-7041.00	Sawing Machine Setters, Operators, and Tenders, Wood	7,695	97.1
51-8011.81	Nuclear Power Reactor Operators	15,339	99.4
51-8012.00	Power Distributors and Dispatchers	9,240	98.1
51-8013.00	Power Plant Operators	14,087	98.2
51-8021.00	Stationary Engineers and Boiler Operators	12,967	97.0
51-8099.53	Biomass Plant Technicians	19,201	98.0
51-9023.00	Mixing and Blending Machine Setters, Operators, and Tenders	16,541	97.2
51-9061.00	Inspectors, Testers, Sorters, Samplers, and Weighers	33,672	96.5
51-9081.71	Dental Laboratory Technicians	9,153	96.9
51-9122.00	Painters, Transportation Equipment	8,576	96.5
51-9199.51	Recycling and Reclamation Workers	7,641	96.6
53-1021.51	Recycling Coordinators	8,033	98.2
53-1031.00	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	14,296	98.7
53-2011.00	Airline Pilots, Copilots, and Flight Engineers	7,913	98.8
53-2021.00	Air Traffic Controllers	22,595	98.4
53-2022.00	Airfield Operations Specialists	14,706	97.8
53-3031.00	Driver/Sales Workers	8,374	97.5
53-3032.81	Heavy and Tractor-Trailer Truck Drivers	35,709	97.0
53-3033.00	Light Truck or Delivery Services Drivers	9,824	98.0
53-4031.00	Railroad Conductors and Yardmasters	10,463	97.8
53-6051.01	Aviation Inspectors	7,217	98.2
53-7032.00	Excavating and Loading Machine and Dragline Operators	9,848	96.1
53-7051.71	Industrial Truck and Tractor Operators	16,272	97.5
53-7061.00	Cleaners of Vehicles and Equipment	11,251	97.9

(continued)

**Exhibit E-11. Item Completion Rates by Occupation (continued)**

<b>Occupation Code</b>	<b>Occupation Title</b>	<b>Questions</b>	<b>Response Rate</b>
53-7062.00	Laborers and Freight, Stock, and Material Movers, Hand	11,770	95.4
53-7081.00	Refuse and Recyclable Material Collectors	5,911	97.5