ABSTRACT

DUVERNET, AMY MARGARET. Sources of Inaccuracy in Job Analysis: A Meta-analytic Investigation. (Under the direction of Mark A. Wilson, Ph.D., and Joan J. Michael, Ph.D.)

Job analysis is a fundamental part of any human resource system; it is used to develop valid and legally defensible selection systems, training programs, and compensation systems (Morgeson & Campion, 1997; Sanchez & Levine, 2001). Unfortunately, information gathered through job analyses can sometimes be inaccurate; when this occurs, the human resource activities based on this information suffer (Morgeson & Campion, 1997). Morgeson and Campion (1997) offer 16 propositions about sources of inaccuracy in job analysis. The current meta-analytic investigation extends previous research on job analytic inaccuracy by testing several of those propositions and examining additional sources of inaccuracy in job analysis. In total, the effects of 20 sample, contextual, and methodological characteristics on indices of both job analytic reliability *and* data quality are explored by meta-analytically combining 209 studies. Results indicate that many of these variables exerted a significant influence of indices of job analytic accuracy. These results can be used to inform job analysts' choice of methodology and post data collection evaluation of job analytic information.

Sources of Inaccuracy in Job Analysis: A Meta-analytic Investigation

by
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BIOGRAPHY

Amy Margaret DuVernet was born April 2, 1982, in Charleston, SC. She earned a high school degree concentrated in music from the University of North Carolina School of the Arts in Winston Salem, NC, in 2000. Next, she completed her undergraduate education at the University of North Carolina in 2004, earning a Bachelor of Arts degree in Psychology. In the fall of 2005, Amy began her graduate studies at North Carolina State University in the Industrial and Organizational Psychology Doctoral program, where she earned a Master of Science degree in Industrial and Organizational Psychology. During her time at North Carolina State University, Amy has worked as a teaching assistant, primary instructor, and undergraduate academic advisor. In addition, Amy has served as a research consultant for several organizations, including the North Carolina State Highway Patrol, SWA Consulting, and the Occupational Information Network (O*NET). Her predominant research interests center around methodological and statistical issues affecting organizational research.

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Literature Review

Job analysis is a fundamental part of any human resource system. There are both legal and practical purposes for conducting such an analysis, including designing legally defensible and valid selection systems, training programs, and performance measures as well as determining compensation levels (Morgeson & Campion, 1997). Given its many uses, it should not be surprising that in the late 1980s, large organizations spent an estimated $150,000 to $4,000,000 annually on job analyses (Levine, Sistrunk, McNutt, & Gael, 1988). Because a large number of organizational systems depend on job analytic information, its accuracy is pivotal to organizational functioning (Morgeson & Campion, 1997). Unfortunately, this information is sometimes inaccurate, as it is often based solely on human judgment and memory, which can be compromised by a number of social biases and information processing limitations (Goldstein, Zedeck, & Schnieder, 1993; Morgeson & Campion, 1997). It is, perhaps, for this reason that a sizable amount of job analytic research focuses on factors that affect the reliability and accuracy of job analytic information (e.g., Desmond & Weiss, 1975; Dierdorff & Wilson, 2003; Landy & Vasey, 1991).

For example, two previous meta-analyses have investigated sources of unreliability in job analysis. Both Dierdorff and Wilson's (2003) and Voskuijl and van Sliedregt's (2002) meta-analyses indicated that the method of conducting a job analysis and the source of the job analytic information impact the reliability of that information. Further, Morgeson and Campion (1997) offer 16 theoretical propositions about sources of inaccuracy in job analysis. The current meta-analytic study adds to these previous investigations by examining the

influence of 20 sample, contextual, and job analytic method characteristics on indices of both the reliability *and* quality of job analytic information. Figure 1 depicts the hypothesized relationships investigated in this study. As can be seen, a number of sources of inaccuracy are assumed to influence job analytic reliability and data quality. The results of this study have implications for organizational decision makers' choices of job analytic techniques. Before discussing sources of inaccuracy, an explanation of job analytic accuracy indicators is provided. This is followed by a discussion of the variables that could impact these indicators.

Indicators of Job Analysis Inaccuracy

Morgeson and Campion (1997) offer 6 indicators of job analytic accuracy including interrater reliability, interrater agreement, discriminability between jobs, factor structure confirmation, mean ratings, and completeness of job information. Of these, the current study focuses on interrater reliability, interrater agreement, factor structure confirmation, and mean ratings. In addition, several other indicators are investigated including intrarater reliability, intrarater agreement, rate-rerate reliability, and endorsement of distractor items. Table 1 presents a list of these indicators and their definitions. These indicators can be categorized as indices of either the reliability or the quality of job analytic data.

Reliability. Reliability is a necessary (albeit, not sufficient) condition for job analytic information accuracy (Gatewood & Field, 2001). The following indicators of job analytic accuracy provide information about the reliability of job analysis data. Interrater reliability is an index of the consistency of ratings across raters; high interrater reliability estimates indicate that the rank orders among raters are consistent across items (Shrout & Fleiss, 1979).

In contrast, interrater agreement is an index of absolute agreement among raters; high interrater agreement estimates indicate similar judgments made by raters across items (Aguinis, Henle, & Ostroff, 2001). *Intra*rater reliability and *intra*rater agreement refer to consistency within a rater; these types of reliability indicators provide an index of the degree to which individual raters answer the same questions similarly (Viswesvaran, Ones, & Schmidt, 1996; Wilson, Harvey, & Macey, 1990). The distinction between intrarater reliability and intrarater agreement is analogous to the distinction between interrater reliability and interrater agreement. Intrarater reliability refers to consistency in the rank orders of items provided by the same rater, while intrarater agreement provides an index of the amount of absolute agreement provided by the same rater across similar items. Finally, rate-rerate reliability refers to the correlation between observed item ratings across more than one administration of those items (Wilson et al., 1990).

Quality. Job analytic data quality provides information about both the accuracy and the validity of job analytic data. Despite a vast literature, including two meta-analytic investigations (Dierdorff & Wilson, 2003; Voskuijl & van Sliedregt, 2002), which explores variables that could influence the reliability of job analytic information, there has been little systematic research investigating variables that influence the quality and validity of such ratings (Manson, Levine & Brannick, 2000). The current study addresses this gap in the literature by providing estimates of the influence of a number of variables on indicators of job analytic data quality, including confirmed factor structures, mean job analytic ratings, and distractor item endorsement.

The dimensionality of the factor structure underlying a job analytic inventory is an index of the complexity of the factor structure of that job analysis instrument; when a job analytic instrument fails to confirm theoretical propositions about the dimensionality of the job, this could be an indication that the instrument is not a valid measure of the job (Morgeson & Campion, 1997). Mean ratings refer to the average job analytic ratings provided by subject matter experts (SME). For example, SMEs may be asked to provide ratings of how often a task is completed or how important a specific ability is to job performance. The average value of these ratings can be used as an index of the extent to which certain types of rater biases are operating (e.g., leniency, severity, etc.). In general, it is difficult to predict the types of rater biases that may operate in job analytic processes; therefore, throughout this paper, research questions about the effects of variables on mean ratings are typically posed. Finally, distractor item endorsement provides additional information about the quality of job analytic data; this index refers to the extent to which raters endorse bogus or irrelevant items that have been included in order to identify individuals who either did not devote enough attention to the task or misrepresented their jobs (e.g., Morgeson, Delaney-Klinger, Mayfield, Ferrara, & Campion, 2004).

Having defined the indicators job analytic information accuracy, I turn now to a discussion of variables that could influence these indicators. The present study focuses on facets related to the organizational context in which the job analysis is conducted, the subjects and jobs that are the focus the analysis, and the methods used in conducting the job

analysis. Figure 1 provides a visual depiction of these relationships and table 2 presents a list of these variables and their definitions.

Context Variables

Contextual variables, such as the size and geographic dispersion of an organization, could influence job analytic accuracy. More specifically, organizational culture may affect the amount of effort that SMEs devote to job analytic ratings as well as their motivation in providing those ratings. In support of this, Morgeson and Campion (1997) assert that socially desirable responding in job analysis (i.e., responding in a manner that reflects socially and culturally accepted standards) can act as a reflection of the organizational culture, as culture provides guidance about organizationally appropriate behaviors and beliefs. Recent research, however, has indicated that organizational context may not play a large role in job analytic ratings; Van Iddekinge, Putka, Raymark, and Eidson (2005) investigated job analytic ratings across five organizations and found that the organization in which the job analysis was conducted did not significantly affect job analytic reliability estimates. They noted, however, that the same parent company owned each of the five organizations, which may have contributed to similarities in culture across the organizations. Therefore, the influence of organizational context on job analytic ratings warrants further investigation.

Organizational size. Organizations that employ a large number of individuals may exhibit different types of organizational cultures than do organizations with fewer employees; large organizations may have more formal restrictions and rules than their small organization counterparts. Indeed, research has shown that organizational size is related to

indicators of organizational culture, such as organizational charitable giving (Arnato & Amato, 2007), organizational innovation (Moch & Morse, 1977), and average organizational theft (Barnes & Webb, 2007). Consequently, it seems likely that organizational size could influence job analytic ratings; however, the direction of that influence is unclear. Therefore, the current research posits the following question:

Research Question 1: Is job analytic accuracy related to organizational size?

Organizational dispersion. Organizational dispersion may also play a role in job analytic ratings. When organizations are highly dispersed, perceptions of the job may vary due to actual and subjectively perceived differences in the job. Actual differences could arise from variation in task needs across geographic regions, while perceived differences might result from regional differentiation in the way individuals perceive their jobs. Given the lack of previous research on this relationship, I posed the following research question:

Research Question 2: Is job analytic accuracy related to organizational dispersion?

Characteristics of the Sample

The accuracy of job analytic information may also depend on the sample respondents and job(s) being studied. Sample characteristics investigated in this study include demographic variability and characteristics of the job being investigated.

Demographic Variability. The sample of job analytic respondents is often quite diverse; key variables on which SMEs could differ are that of age, gender, race, and tenure. A large body of research has addressed the relationship between demographic variables and job analytic accuracy; however, the results of these investigations have been mixed, with

some studies indicating that demographic variables influence job analytic ratings (e.g., Arvey, Passino, & Lounsbury, 1977; Fried & Ferris, 1986; Silverman, Wexley, & Johnson, 1984), and others finding no differences across groups (e.g., Aamodt, Kimbrough, Keller, & Crawford, 1982; Landy & Vasey, 1991). In situations where a body of research has produced mixed findings, meta-analyses provide an excellent method of resolving those conflicting findings and producing generalizable conclusions (Hunter & Schmidt, 2004); therefore, this study addresses lingering questions related to these variables.

Demographic variability in the sample of respondents may result in lower reliability and data quality estimates due to differing perspectives and perceptions about the job (Aamodt et al., 1982). For this reason, I hypothesized that homogenous samples would provide more accurate job analytic ratings than would heterogeneous samples; however, the influence of demographic variability on mean job analytic ratings is unclear.

Hypothesis 1: Demographic variability is negatively related to job analytic accuracy (i.e., interrater reliability, interrater agreement, factor structure confirmation, intrarater reliability, intrarater agreement, rate-rerate reliability, and non-endorsement of distractor items).

Research Question 3: Is demographic variability related to mean job analytic ratings?

Characteristics of the job. Characteristics of the job being analyzed may also influence job analytic accuracy. Variables hypothesized to influence accuracy include the complexity of the job, the level of interdependence within the job, and the number of incumbents that hold the job. Each of these is discussed below.

Job complexity. Job complexity refers to the extent to which a job involves relatively complex tasks, such as mental processing tasks. Jobs that are complex in nature tend to require the completion of tasks that are less tangible than those required by simpler jobs. Therefore, ratings of tasks may be more subjective when job are highly complex (Sanchez, Zamora, & Viswesvaran, 1997). Sanchez et al. (1997) investigated the effect of job complexity on agreement between incumbent and nonincubment samples of SMEs and found that agreement was highest for relatively simple jobs. Further, Haerem and Rau (2007) also found that task complexity was related to job analytic ratings. Based on this previous research, I hypothesized that job analytic accuracy is lower in complex jobs; however, the influence of job complexity on mean job analytic ratings is unclear.

Hypothesis 2: Job complexity is negatively related to job analytic accuracy (i.e., interrater reliability, interrater agreement, intrarater reliability, intrarater agreement, rate-rerate reliability, confirmed factor structures, and distractor item non-endorsement).

Research Question 4: Is job complexity related to mean job analytic ratings?

Job interdependence. Interdependence refers to the amount of connectedness between job incumbents in a given job; the performance of an employee in a highly interdependent job depends heavily on the performance of his or her coworkers (Morgeson & Humphrey, 2006; Dierdorff & Morgeson, 2007). Dierdorff and Morgeson (2007) found that interdependence negatively related to job analytic reliability estimates. They theorized that interdependence leads to higher levels of task specification, such that specific job tasks are

more likely to be distributed to different individuals within the job as interdependence increases (Dierdorff & Morgeson, 2007). When this occurs, interdependence should lead to lower levels of job analytic reliability and data quality due to actual differences in the job being analyzed. For this reason, I have hypothesized that interdependence is negatively related to job analytic accuracy; however, the influence of interdependence on mean ratings is less clear.

Hypothesis 3: Job interdependence is negatively related to job analytic accuracy (i.e., interrater reliability, interrater agreement, intrarater reliability, intrarater agreement, and rate-rerate reliability, factor structure confirmation, and distractor item non-endorsement).

Research Question 5: Is job interdependence related to mean job analytic ratings?

Number of incumbents. The number of incumbents that hold a given job could also influence the accuracy of information gathered about that job. When a large number of individuals fill the same position, there may be greater variability in actual role requirements. Further, when there are larger numbers of incumbents, there may be greater diversity in subjective perceptions of the job; however, because previous research investigating this relationship could not be located, I posed the following question:

Research Question 6: Is job analytic accuracy related to the number of incumbents that perform the focal job?

Job Analysis Characteristics

Finally, the methods used to collect job analytic information may also influence its accuracy. The following represents a list of different methodological decisions that a job analyst must make before collecting job information. Each of these decisions should influence the accuracy of that information.

Purpose. First, the purpose for conducting a job analysis varies; the most common purposes include the development of selection systems or training programs, and/or the determination of compensation levels (Morgeson & Campion, 1997). Morgeson and Campion (1997; in press) assert that the purpose of conducting a job analysis likely influences the motivation job analysis respondents. For example, job incumbents might be motivated to exaggerate their responsibilities if the purpose of the analysis is to determine compensation levels, as this may result in higher salaries. Alternatively, they may be less motivated to distort their ratings when the information will be used for selection purposes (Morgeson & Campion, 1997). Furthermore, when the job analysis is conducted for less personally relevant reasons (e.g., designing selection systems or conducting research), job incumbents may not be motivated to provide accurate ratings, as they may be aware that the decisions resulting from such information will not impact them personally (Morgeson & Campion, 1997). For these reasons, I believe that job analyses conducted for less personally relevant purposes result in higher carelessness on the part of the incumbent as reflected by lower levels of both reliability and data quality and decreased motivation to exaggerate responsibilities as reflected by lower mean job analytic ratings.

Hypothesis 4: The personal relevance of the purpose of conducting a job analysis is positively related job analytic accuracy.

Type of information. Another variable on which job analyses differ is the type of information collected during the analysis (i.e., worker-oriented or job-oriented information). Worker-oriented information refers to the types of knowledge, skills, abilities, and other characteristics (KSAO) that are required for an employee to successfully complete job tasks. In contrast, job-oriented information focuses solely on the job; this information refers to the tasks and procedures that make up the job being analyzed (Morgeson & Campion, 1997; Sanchez & Levine, 2001). Job-oriented information is relatively more objective and verifiable than worker information, as the tasks that are completed within a given job tend to be relatively concrete. In contrast, information related to the worker characteristics required by the job may be more subjective and require a number of inferences on the part of the SME (Gatewood & Field, 1994; Morgeson & Campion, 1997; Sanchez & Levine, 2001). Because the reliance on inferences introduces the possibility of errors in judgment, it seems reasonable to expect that worker-oriented job analysis information is less accurate than job-oriented job analysis information; however, the influence of the type of information collected on mean job analytic ratings is less clear.

Hypothesis 5: Job-oriented job analyses produce more accurate job analytic information (i.e., interrater reliability, interrater agreement, intrarater reliability, intrarater agreement, rate-rerate reliability, factor structure confirmation, and distractor item non-endorsement) than do worker-oriented job analyses.

Research Question 7: Do mean job-oriented job analytic ratings differ from mean worker-oriented job analytic ratings?

Job analytic approach. Similar to worker-oriented job analyses, competency modeling is a method of gathering job information that can be used to describe a job in terms of the KSAOs that are necessary for distinguishing optimal performance from average performance (Campion, Fink, Ruggeberg, Carr, Phillips, & Odman, 2011). Key differences between competency modeling and more traditional approaches to job analysis include the focus, purpose, and time orientation of the analysis (Campion et al., 2011; Lievens & Sanchez, 2007; Sanchez & Levine, 2009). While traditional approaches tend to focus solely on the job being analyzed, competency modeling generally embodies a more macro level focus which emphasizes the importance of the job to both organizational goals and systems. Further, this method of gathering job analytic information is more likely to be used for developmental purposes and tends to include information about future job requirements (Sanchez & Levine, 2009).

While only a handful of studies have empirically investigated the accuracy of information gathered through competency modeling, many believe that this information is less accurate than that of traditional job analyses (Schippmann et al., 2000). Indeed, the small group of studies that has investigated this possibility has tended to conclude that such information is less accurate (e.g., Lievens & Sanchez, 2009; Lievens, Sanchez, & De Corte, 2004; Morgeson, Delaney-Klinger, Mayfield, Ferrara, & Campion, 2004). Given this research and the emphasis of competency modeling on factors that require relatively

subjective judgments (e.g., KSAOs, future job requirements, etc.), I hypothesized that the information gathered through competency modeling is less accurate than that gathered through traditional job analyses. However, the influence of competency modeling on mean ratings is less clear.

Hypothesis 6: Job information gathered through competency modeling is less accurate (in terms of interrater reliability, interrater agreement, factor structure confirmation, intrarater reliability, intrarater agreement, rate-rerate reliability, and non-endorsement of distractor items) than information gathered through traditional job analytic approaches.

Research Question 8: Do mean job ratings gathered through competency modeling differ from those gathered through traditional job analytic approaches?

Data collection method. Typical methods for collecting job analytic information include direct observation, individual interviews, panel interviews, and questionnaires (Brannick et al., 2007; Morgeson & Campion, 1997; Sanchez & Levine, 2001). Using multiple methods is generally recommended in order to reduce systematic biases which may occur when only one technique is used (Brannick et al., 2007; Morgeson & Campion, 1997). For example, panel interviews may be subject to biases related to group dynamics (Maurer & Tross, 2000; Morgeson & Campion, 1997). On the other hand, direct observation may not capture the entire nature of the job if job tasks vary over time (Brannick et al., 2007). While some research has shown that various methods tend to produce similar results (Maurer & Tross; Tannenbaum & Wesley, 1993), recommendations for using multiple methods persist

(e.g., Brannick et al., 2007; Morgeson & Campion, in press). Therefore, I posited a question about the influence of the number of methods of data collection used on job analytic accuracy.

Research Question 9: Does job analytic information accuracy depend on the use of multiple data collection methods?

Source of job analytic information. The source of the job analytic information, or SME, may influence the accuracy of that information. Most analyses rely on information gathered from job incumbents, their supervisors, and/or job analysts (Morgeson & Campion, 1997; Sanchez & Levine, 2001). Each of these sources contains different perspectives on the job and could be susceptible to a number of social and cognitive biases (Morgeson & Campion, 1997). Meta-analyses have shown that job analysts produce the highest interrater reliability estimates, while job incumbents produce the lowest interrater reliability estimates (Dierdorff & Wilson, 2003; Voskuijl and van Sliedregt, 2002). Although the present study expands upon these meta-analyses by investigating a number of different indicators of job analytic accuracy, it seems likely that the pattern of findings will be similar for most of the accuracy indices; however, the influence of source on mean job analytic ratings is less clear.

Hypothesis 7: Job analytic accuracy varies across different sources of information, such that job analysts provide the most accurate job analytic ratings, followed by supervisors, and finally, job incumbents.

Research Question 10: Do mean job analytic ratings vary across information sources?

Provision of rater training. Many job analysis efforts include SME training in order to increase the possibility that job analytic information will be accurate (Brannick et al., 2007; Voskuijl & van Sliedregt, 2002). Voskuijl and van Sliedregt's (2000) meta-analysis did not find an effect of training on the reliability of job analytic ratings; however, other studies have shown that training increases the quality of such ratings (Lievens & Sanchez, 2007) or have produced mixed findings (Lysaght, Shaw, Almas, Jogia, & Larmour-Trode, 2008). For this reason, I posed a question about the influence of training on job analytic accuracy.

Research Question 11: Does the provision of SME rater training influence job analytic accuracy?

Characteristics of the job analysis inventory. ***Source of survey.*** Several characteristics of the job analysis inventory could influence accuracy. First, the source of the inventory could impact the information that is gathered. Many standardized and previously developed job analytic inventories exist (e.g., the Position Analysis Questionnaire, O*NET Generalized Work Activities, the Job Components Inventory, etc.). These inventories are generally applicable to most jobs. In contrast, study developed inventories tend to be situation and job specific. Dierdorff and Wilson (2003) found that the reliability of ratings gathered using the Position Analysis Questionnaire was lower than those derived from other types of job analytic inventories. However, little research has explicitly examined the difference in job analytic accuracy across these two types of job analytic inventories. Therefore, I posed the following research question:

Research Question 12: Does the type of inventory used impact job analytic accuracy?

Inventory length. The length of the inventory may also impact information accuracy. Longer inventories have the potential to fatigue respondents (Aguinis et al., 2001) which may result in careless responding and decreased information accuracy (Morgeson & Campion, in press). On the other hand, classical psychometric theory predicts that longer questionnaires will be more reliable than shorter questionnaires (Nunnally & Bernstein, 1994; Woods & Hampson, 2005). In addition, long inventories may provide more accurate information if short inventories fail to fully capture the job domain. It seems that the relationship between job analytic inventory length and the accuracy of job analytic information may be nonlinear. For this reason, I hypothesized that the relationship between length and most of the indices of accuracy would be curvilinear; however, it was difficult to determine how length would influence mean ratings, therefore I posed a question about this relationship.

Hypothesis 9: The relationship between job analytic inventory length and job analytic accuracy (i.e., interrater reliability, interrater agreement, factor structure confirmation, intrarater reliability, intrarater agreement, rate-rerate reliability and distractor item non-endorsement) is curvilinear such that an optimal length exists; inventories that exceed or fall short of this optimal length will be less accurate.

Research Question 13: Is the length of the job analytic inventory related to mean job analytic ratings?

Level of specificity. Another property of the job analysis instrument that could influence its accuracy is the level of specificity that it employs. Job-oriented job analyses typically gather information at the task, task cluster, duty, or job level of specificity

(Campion, Mumford, Morgeson, & Nahrgang, 2005; Morgeson & Campion, 2002). The task level collects data about distinct work activities (e.g., Consult with team members to determine their needs; Morgeson & Campion, 2002) and provides the most detailed information about the job; unfortunately, this level can sometimes produce a large number of items, which, as discussed earlier, may lead to inaccuracy. The next level of specificity is that of the task cluster; a task cluster consists of a group of relatively interdependent tasks and activities that are performed by one person and generally make up a whole portion of work (e.g., Identify and communicate team resource requirements; Campion et al., 2005). Job duties represent a broader level of analysis; duties are groupings of tasks that taken together are a major portion of work (e.g., Ensure proper team functioning; Campion et al., 2005). Finally, the job level is one of the broadest levels at which information is collected; this method asks for information about the overall job (Campion et al., 2005). Research has shown that the level of specificity can influence reliability estimates such that more specific levels tends to produce higher reliability estimates (Butler & Harvey, 1988; Dierdorff & Wilson, 2003; Harvey & Wilson, 2000; Sanchez & Levine, 1994). Based on this, I hypothesized the following:

> Hypothesis 10: Specificity is positively related to job analytic accuracy (i.e., interrater reliability, interrater agreement, intrarater reliability, intrarater agreement, rate-rerate reliability, factor structures confirmation, and distractor item non-endorsement).
>
> Research Question 14: Is specificity related to mean job analytic ratings?

Worker characteristic. Worker-oriented job analyses, on the other hand, typically gather information about worker characteristics rather than tasks, task clusters, duties, or jobs. The most common worker characteristics collected fall into the following general categories: knowledge, skills, abilities, and personality traits (Brannick et al., 2007). The level of inference required by each of the categories and thus the accuracy of information collected using these categories likely vary; however, it is difficult to anticipate the pattern of that variance. Therefore, I posed the following research question:

Research Question 15: Does job analytic accuracy vary across worker-oriented categories?

Type of rating scale. Finally, the type of rating scale used in a job analytic inventory may influence accuracy. Job analytic inventories generally ask respondents to rate tasks or attributes on a number of scales, such as the frequency with which the task is performed or the importance of the attribute to the job (Dierdorff & Wilson, 2003; Manson et al., 2000). Research has suggested that the type of rating scale used influences reliability estimates (Dierdorff & Wilson, 2003; McCormick & Ammerman, 1960; Morsh, 1964; Wilson, Harvey, & Macy, 1990). Certain rating scales require fairly objective and verifiable judgments (e.g., time spent on the task and frequency of task performance), while others require more subjective judgments (e.g., the importance of an attribute or task to task performance). Judgments about objective properties of the job should be less susceptible to rater biases and information processing limitations than should judgments about subjective properties. Therefore, I hypothesized the following:

Hypothesis 11: Ratings of objective properties of the job are more accurate than are ratings of the subjective job properties.

Research Question 16: Does the type of rating scale influence mean job analytic ratings?

In sum, the current study poses 11 hypotheses and 16 research questions related to the influence of 20 sample, contextual, and job analytic method characteristics on 8 indicators of job analytic accuracy. While previous meta-analytic research has investigated factors influencing reliability in job analysis, this study expands upon this work by investigating the influence of additional sources of inaccuracy on both job analytic reliability and data quality. Further, this study represents a test of many of Morgeson and Campion's (1997) theoretical propositions about sources of inaccuracy in job analysis. Results of this investigation should provide guidance to job analysts in their choice of methods and their interpretations of job analytic indicator estimates.

Method

Inclusion Criteria

To be included in this analysis studies were required to: 1) have conducted a job analysis on one or more jobs, 2) present an estimate of one or more of the indicators of inaccuracy investigated in the study (see Table 1), and 3) present information relevant to at least one of the variables hypothesized to influence job analytic accuracy (see Table 2).

Literature Search

Several keyword searches of a number of electronic databases were conducted (i.e., PsychINFO, PsycARTICLES, Military and Government Collection, Business Source Premier, and Web of Science), using the following search terms: *job analysis*, *work analysis*, *job information accuracy*, and *competency model*. In order to decrease the possibility of publication bias related to the "file-drawer" problem, I also attempted to locate studies not catalogued within the aforementioned electronic databases (i.e., unpublished manuscripts, conference presentations, etc.), by sending email requests to a number of authors actively researching in the field of job analysis, posting requests to listservs managed by relevant organizations (i.e., the Society for Industrial and Organizational Psychology [SIOP], the European Association of Work and Organizational Psychology [EAWOP], and the Academy of Management [AOM]), examining the recent conference proceedings of relevant organizations (e.g., SIOP, EAWOP, AOM, etc.), and reviewing the bibliographies of previous quantitative and qualitative reviews of job analysis.

These efforts yielded 3,008 articles. The titles and abstracts of these articles were reviewed and studies that did not meet the inclusion criteria were eliminated from further review. Based on this step, 971 studies were obtained and thoroughly examined to determine if they provided enough information to be included in this analysis. The final sample consisted of 209 articles, 53 (25%) of which were unpublished. Of note is the difference between the number of included studies in this analysis and those included in previous meta-analyses on this topic. Voskuijl and van Sliedregt (2002) and Dierdorff and Wilson (2003)

included 38 and 46 studies in their analyses, respectively. This large discrepancy is evidence of the noticeable progress made by electronic databases in terms of indexing citations on this topic. Further, this discrepancy can also be attributed to the broader scope of the current study.

Variable Coding

Indices of Accuracy. Table 1 provides the operational definitions that were used to define and encode each index of job analytic accuracy. It should be noted that several of the indices were represented by more than one statistic (e.g., interrater reliability was represented as both a correlation and an intraclass correlation across studies). The type of statistic reported was encoded in order to examine differences in the main effects produced by each statistic. Further, similar to other meta-analyses of interrater reliabilities (e.g., Connelly & Ones, 2010; Voskuijl & van Sliedregt, 2002), only single rater interrater reliabilities were examined; therefore, during the coding process, reliabilities were reduced to that of a single rater using the Spearman Brown formula.

Independent Variables. Table 2 reviews the operational definition of each independent variable investigated. The categories used to code moderator variables were partially data driven, as I was limited to categories that were present in the population of studies included in the analysis. In order to ensure coding reliability, a random sample of 20% of the articles (42 articles) was selected and variables requiring subjective judgments (purpose of analysis, job complexity, job interdependence, and organizational dispersion) were coded by a second rater, holding a Master's degree in Industrial/Organizational (I/O)

Psychology. Initial intercoder reliability was 0.76, an estimate that is comparable to other published meta-analyses (e.g., Nahrgang, Morgeson, & Hoffman, 2011). Discrepancies were discussed and resolved through the use of a consensus meeting. Because encoding all of the other variables did not require subjective judgments, I provided the sole code for each of them.

Analysis

Mason, Allam, and Brannick's (2007) Monte Carlo study revealed that Hunter and Schmidt's (2004) method of meta-analysis produces the most accurate main effect estimates of coefficients of stability. Therefore, their random-effects method of analysis was used to correct each study individually for sampling error by weighting each individual indicator of job analysis accuracy with the product of its sample size before aggregating across results. Further, when studies contained more than one effect per accuracy indicator, these effects were combined in order to meet the meta-analytic assumption of independence of observations.

Before investigating the influence of each of the sample, methodological and contextual variables on each accuracy indicators, I first tested for heterogeneity in each of the indices using Hunter and Schmidt's (1990) χ^2 test for homogeneity. When this value is significant, it indicates that subpopulation values of the accuracy index exist (Hunter & Schmidt, 1990). For all indicators that exhibited a significant χ^2 value, moderator analyses were used to determine the influence of each independent variable on the accuracy index.

Weighted least-squares (WLS) multiple regression analyses were used to investigate the influence of continuous independent variables (i.e., variables that were of ordinal, interval, or ratio levels of measurement) following Hedges and Olkin's (1985), Steel and Kammeyer-Mueller's (2002), and Mason et al.'s (2007) recommendations. In order to investigate hypothesis 9, the nonlinear relationship between inventory length and each of the indices of accuracy was tested using a quadratic regression equation. For this test, a statistically significant quadratic effect provides support for the curvilinear relationship between length and accuracy.

Because a number of the variables were categorical in nature and thus did not lend themselves to regression analyses, the influence of categorical independent variables was tested using Hunter and Schmidt's (2004) subgroup method of moderator analysis. When subgroups exhibited different effect size estimates and lowered variance estimates, I concluded that the independent variable exerted an influence.

Results

Table 3 presents the average value of each accuracy indicator in the population of studies. As can be seen, only two studies presented information related to intrarater agreement; therefore, moderator tests of this index could not be conducted. Further, the homogeneity test of intrarater reliability revealed that moderators of this index were unlikely. Thus, sources of inaccuracy in this index were not examined. All of the other indices were tested for moderator effects. Tables 4-9 present the results of the WLS regression analyses by accuracy index. Tables 10-15 present the results of the subgroup moderator analyses by

accuracy index. Finally, table 16 presents a summary of the influence of each of these variables on job analytic accuracy. It should be noted that the influence of a number of moderators on one or more of the accuracy indices could not be tested due to insufficient studies presenting pertinent information.

Organizational Size

Research question 1 asked about the influence of organizational size on job analytic accuracy. Results revealed that size was significantly and negatively related to mean job analytic ratings, such that mean ratings were lower in large organizations than they were in small organizations. Size did not exert a significant effect on any of the other accuracy indices.

Organizational Dispersion

Research question 2 focused on the influence of organizational dispersion on job analytic accuracy. Results indicated that dispersion significantly influenced interrater agreement, factor structure confirmation, and mean job analytic ratings. This influence was negative for both interrater agreement and mean ratings and positive for factor structure confirmation, such that agreement was higher, factor structures were more likely to be confirmed, and mean job analytic ratings were higher when organizations were less geographically dispersed.

Demographic Variability

Hypothesis 1 proposed that job analytic accuracy would be lower when SMEs were demographically heterogeneous. Results partially support this hypothesis. Variability in SME

age exerted a significant negative influence on factor structure confirmation, such that as variability increased, factor structures were more likely to be confirmed. In contrast and in support of the hypothesis, variability in both race and tenure exerted significant positive influences on facture structure confirmation. Further, variability in incumbent gender exhibited a negative relationship with interrater reliability, such that as variability increased, interrater reliability decreased. Finally, in answer to research question 3, which asked about the influence of demographic variability on mean ratings, only sample tenure exerted a significant influence, with the direction of that influence being positive.

Job Complexity

Hypothesis 2 predicted that job complexity would be negatively related to job analytic accuracy. In partial support of this hypothesis, job complexity significantly influenced both interrater reliability and factor structure confirmation. As complexity increased, interrater rater reliability decreased and factor structures were less likely to be confirmed. Further, research question 4 asked about the influence of complexity on mean ratings; complexity positively influenced mean ratings such that they were higher as complexity increased.

Job Interdependence

Hypothesis 3 suggested that job interdependence would be negatively related to job analytic accuracy. This hypothesis was partially supported; interdependence negatively influenced interrater reliability, such that reliability was highest when jobs were low in interdependence. Additionally, research question 5 asked about the influence of

interdependence on mean ratings; results showed that interdependence did not influence mean job analytic ratings.

Number of Job Incumbents

Research question 6 asked about the influence of the number of incumbents on job analytic accuracy. Results indicated that the number of job incumbents holding the focal job was not related to any of the indices of job analytic accuracy.

Purpose

Hypothesis 4 posited that the personal relevance of the purpose of conducting the job analysis would influence job analytic accuracy. In support of this hypothesis, interrater agreement was higher, rate-rerate reliability was higher, distractor items were endorsed less often, mean ratings were higher, and factor structures were more likely to be confirmed when the purpose of the job analysis was relevant. Results for each index by specific purposes (i.e., selection, training, etc.) are presented in tables 10-15.

Type of Information

Hypothesis 6 proposed that the type of information collected would be related to job analytic accuracy. In support of this hypothesis, interrater and rate-rerate reliability estimates were higher when job-oriented information was collected rather than worker-oriented information. In contrast, interrater agreement indices were lower and factor structures were less likely to be confirmed when job-oriented information was collected. Therefore, results related to hypothesis 6 were mixed. Finally, in answer to research question 7, which asked

about the influence of the type of information on mean ratings, ratings were lower when job-oriented information was collected.

Job Analytic Approach

Hypothesis 7, which suggested that accuracy would be lower when job analyses were conducted using competency modeling rather than traditional approaches, could only be examined in reference to interrater agreement. Results did not support the hypothesis, as interrater agreement estimates were higher for competency modeling approaches than they were for traditional approaches. Research question 8 asked about the difference in mean job analytic ratings across the two approaches. Results revealed that mean ratings were higher when they were collected through competency modeling.

Number of Data Collection Methods

Research question 9 asked whether the use of multiple methods of data collection influenced job analytic accuracy. Results revealed that this variable was unrelated to any of the indices of job analytic accuracy.

Source of the Job Analytic Information

Hypothesis 7 focused on the influence of the source of information on job analytic accuracy. In support of this hypothesis, interrater reliability estimates were greatest for job analysts and for students, who tended to be I/O psychology graduate students. This was followed by mixed sources and supervisors; incumbents provided the lowest interrater reliability estimates. Similarly, rate-rerate reliability indices were greatest when ratings were gathered from supervisors and job analysts, and were lowest when ratings were gathered

from job incumbents. In contrast, interrater agreement estimates were greatest when they were gathered from both mixed sources and job incumbents; they were lowest when ratings were gathered from job analysts and students. Similarly, factor structures were more likely to be confirmed when ratings were gathered from job incumbents as opposed to job analysts. Thus, the influence of the source of the information on job analytic accuracy indices was mixed. Further, in answer to research question 10, which asked about the influence of the source of information on mean ratings, ratings were lowest when they were gathered from supervisors and highest when they were gathered from job analysts and mixed sources.

Rater Training

Research question 11 asked about the influence of SME rater training on job analytic accuracy. Results showed that the provision of rater training influenced both interrater reliability and mean ratings, such that each of these indicators was higher when training was provided. Unfortunately the influence of rater training on the other indices could not be tested due to an insufficient number of studies reporting these indices.

Source of Survey

In answer to research question 12, which asked about the influence of the source of the survey on job analytic accuracy, reliability and agreement indices were higher when a previously developed, standardized measure was used to collect data rather than a study specific measure. In contrast, factor structures were more likely to be confirmed when a study specific measure was used. Additionally, mean ratings were higher when they were gathered using a standardized measure.

Inventory Length

Hypothesis 9, which proposed that an optimal job analytic inventory length exists, was not supported. The length of the task inventory exhibited a significant curvilinear influence on interrater reliably; however that significant effect was in the wrong direction, suggesting that interrater reliability was greatest for both relatively short and relatively long inventories. Further, the influence of task inventory length on interrater agreement was linear, as evidence by a nonsignificant quadratic term. Moreover, the linear influence of length on interrater reliability and interrater agreement was not consistent; length exerted a negative influence on interrater reliability and a positive influence on interrater agreement. Finally, in answer to research question 13, the length of the job analysis inventory did not influence mean job analytic ratings.

Level of Specificity

Hypothesis 10, which proposed that accuracy would be positively related to specificity, was not supported; instead, interrater reliability, interrater agreement, and rate-rerate reliability estimates were highest when the job was the level of analysis used. Further, factor structures were more likely to be confirmed when the job analytic data were collected at the duty level rather than the task level. Finally, in answer to research question 14, mean ratings were influenced by specificity, ratings of task clusters exhibited the lowest means while job ratings exhibited the highest means.

Worker Characteristic

Research question 15 asked about differences in job analytic accuracy across worker characteristics. This question could only be examined for a few of the indices. Interrater reliability estimates were greatest when personality was the worker characteristic studied and lowest when abilities and skills were the characteristic studied. Further, mean job analytic ratings were highest when mixed worker characteristics and knowledge were studied and lowest when personality was the focus.

Rating Scale

Finally, hypothesis 11 asserted that accuracy would be highest when the rating scale used did not require subjective judgments. Results provide partial support for this hypothesis. Interrater reliability and rate-rerate reliability estimates were higher when objective judgments were collected. Similarly, factor structures were more likely to be confirmed when objective scales were used. In contrast, interrater agreement was highest and distractor items were less likely to be endorsed when subjective judgments were collected. Tests of research question 16 revealed that mean ratings were greatest when objective scales were used. Estimates of each accuracy indicator by specific type of scale are presented in tables 10-15.

Discussion

The present study represents a follow up and expansion of two previous meta-analyses focused on the reliability of job analytic ratings (i.e., Dierdorff & Wilson, 2003; Voskuijl & van Sliedregt, 2002) and answers Dierdorff and Wilson's call for more work on the theoretical determinants of job analytic accuracy. Further, this investigation represents

the first meta-analytic test of many of Morgeson and Campion's (1997) theoretical propositions about sources of inaccuracy in job analysis. The goal of this study was to identify sources of inaccuracy in job analytic information as reflected by indices of both the reliability *and* quality of that information. In total, 209 studies were meta-analytically combined to investigate 11 hypotheses and 16 research questions. Results provide support for the proposition that characteristics of the organization, sample, and job analytic method affect the accuracy of job analytic information.

While many of the results pertaining to the influence of job analytic method characteristics can be used to determine best practices for conducting job analyses, results related to sample and organizational characteristics are not so easily altered for specific job analyses. Instead, these results can be used as benchmarks to determine the levels of accuracy that can be anticipated given specific sample and organizational characteristics. For example, when organizations are geographically dispersed, indices of job analytic accuracy will generally be lower than they will be for less dispersed organizations. Similarly, when jobs are complex in nature and highly interdependent, lower accuracy indices can be expected. These findings answer Dierdorff and Wilson's (2003) call for research investigating the influence of both job complexity and dispersion on interrater reliability. Further, results pertaining to SME demographic heterogeneity can be used to predict the general accuracy levels that can be expected given SME samples' demographic make-up.

Several findings do, however, lend themselves to recommendations for best practices. Although the purpose of conducting a job analysis is specific to each job analytic effort, the

results of this study indicate that it may be important to communicate to SMEs that the job analytic information collected can and will be used for multiple purposes, including those that are personally relevant (e.g., the determination of compensation levels). This recommendation is based on the finding that accuracy is higher when the purpose of conducting a job analysis is personally relevant. Thus, Morgeson and Campion's (1997) proposition about the influence of the purpose on job analytic results was supported. Furthermore, contrary to Voskuijl and van Sliedregt's (2002) findings, results revealed that rater training positively impacts interrater reliability estimates. This discrepancy is likely due to differences in the analyses used to identify significant findings. Based on the current results, the provision of rater training is recommended whenever possible.

An interesting result relates to differences revealed between reliability and agreement estimates. For several of the hypotheses and research questions, these two types of indices produced conflicting conclusions. For example, reliability estimates were higher for job-oriented information than they were for worker-oriented information. The findings were reversed for interrater agreement. This was also true for the comparison between different sources of job analytic information and between rating scale used. Job analysts and students produced the greatest reliability estimates while job incumbents produced the lowest reliability estimates. The contrary was true for interrater agreement. Moreover, reliability estimates were highest when objective rating scales were used, whereas agreement estimates were highest when subjective rating scales were employed. One explanation for the different findings across job information sources could be the influence of the number of raters used.

Interrater reliability estimates were reduced to a single rater estimate in order to control for differing numbers of raters across studies using the Spearman Brown formula. Unfortunately, to my knowledge, no comparable formula exists to control for the number of raters used to derive interrater agreement estimates. Job analyst SME sample sizes tended to be much smaller than did their job incumbent counterparts. To the extent that larger samples produce greater interrater agreement, it is possible that the interrater agreement findings for this variable are an artifact of the number of raters. Still, it is clear that reliability estimates provide different information than agreement estimates. Lebreton and Senter (2008) assert that the choice between the two should be based on the purposes for which the data will be used. In the case of job analysis, it is difficult to make an argument for one type of index over another; therefore, job analysts must strive to optimize both types of indicators.

Limitations and Suggestions for Future Research

This study is not without limitations. First, as with any meta-analysis, results are limited to the population of studies identified. It is possible that the studies included in this analysis systematically differ from studies that were not publically available. For example, the vast majority of studies used a traditional job analytic approach rather than a competency modeling approach. Given the popularity of competency modeling (Sanchez & Levine, 2009), it is somewhat surprising that more competency modeling studies were not uncovered. However, this may be due to reporting conventions for each approach; many of the articles using traditional job analytic approaches reported job analytic information as a side note rather than as the focus of the study. If competency modeling is more likely to be the focus of

an article, it is possible that only high quality competency modeling studies have made it to publication and were therefore more likely to be identified for inclusion in this analysis. If true, this would explain the higher levels of interrater agreement found for competency modeling approaches. Nevertheless, every effort was made to obtain studies from unpublished sources. Indeed, the current meta-analysis is based on almost five times the number of studies included in previous meta-analyses of the topic (see Dierdorff & Wilson, 2003 and Voskuijl & van Sliedregt, 2002).

Unfortunately, I was unable to investigate the influence of many of the independent variables on accuracy indicators due to an insufficient number of studies reporting results relating to these variables. The vast majority of effect sizes gathered provided estimates of either interrater reliability or mean job analytic ratings. Far fewer studies reported information pertaining to intrarater reliability, intrarater agreement, and distractor item endorsement. Additionally, many of my results are based on a relatively small number of studies. Readers are cautioned to interpret findings in light of the number of studies on which each result is based. It is clear that more primary research is needed to investigate some of the hypotheses of the present study.

Another limitation stemming from the insufficient number of studies reporting pertinent information is that I was unable to investigate interactions between independent variables. It is highly likely that the sources of inaccuracy interact with each other to influence job analytic accuracy. For example, the purpose of the job analysis may be more likely to influence SME motivations when SMEs are job incumbents or supervisors, rather

than job analysts. Further, inventory length and inventory specificity are likely confounded. Contrary to previous research findings (e.g., Dierdorff & Wilson, 2003), results revealed that specificity was negatively related to accuracy, such that indices reflected greater accuracy when less specific levels of analysis were used. However, this finding may be related to the number of items needed to collect specific information, as the collection of task information generally requires more items than does job information. Future research is needed to parcel out these specific effects and investigate the potential for interactions amongst the sources of inaccuracy investigated here.

A somewhat surprising finding stems from the nonsignificant influence of the use of multiple methods on job analytic accuracy. Guidelines for conducting job analyses generally stress the importance of using multiple methods to avoid issues with inaccuracy (e.g., Brannick et al., 2007); however, I found no influence of the use of multiple methods on any of the accuracy indictors. It is possible that many studies used multiple methods but did not report that information. It is also possible that certain combinations of methods produce higher levels of job analytic accuracy than do other combinations. For example, direct observation on the part a job analyst may result in more accurate job analytic ratings when the job analyst will be providing those ratings or when the job analyst will be developing a study specific job analytic inventory. More research on this topic would be useful.

Finally, it must be noted that although each accuracy index is expected in the aggregate to indicate issues with job analytic accuracy, none of these indices provides irrefutable evidence of inaccurate job analytic information (Dierdorff & Wilson, 2003;

Morgeson & Campion, 1997). For example, while low reliability and agreement estimates could be an indication that the information gathered is inaccurate, they may also reflect actual differences in tasks across incumbents who share the same job title or, in the case of rate-rerate reliability, they may signify changes in the job over time. Similarly, indices of data quality may serve as a reflection of the true nature of the job. For example, distractor item endorsement may indicate that some of the tasks performed by incumbents were not necessarily included in what the organization or job analyst believed to be part of the job. Likewise, when theoretical propositions about the dimensionality of a job are not confirmed by the factor structure of the job analytic inventory, this may be an indication that those propositions were not an accurate depiction of the job. Moreover, my operationalization of factor structure confirmation does not account for differences in the item make up of factors. Although studies may have confirmed the hypothesized number of factors present in a job analytic inventory, items that define those factors may not have been confirmed. The determination of whether each of these indices reflects true job characteristics or inaccurate information is beyond the capabilities of this analysis; therefore, the reader is cautioned to review the results with these caveats in mind.

Conclusion

The importance of job analyses as the foundation of numerous human resource systems cannot be overstated. Overall, this study advances the field of job analytic research by identifying organizational, sample, and methodological characteristics that influence the accuracy of data gathered during job analyses, confirming several of Morgeson and

Campion's (1997) theoretical propositions on job analysis accuracy. It is my hope that the results of this investigation can be used by organizational decision makers when determining both best practices for conducting job analyses and identifying instances where lower estimates of accuracy should naturally be expected. Moreover, the results of this study provide guidance for future primary research; more research on the influence of these and other sources of inaccuracy is needed to develop a complete model of job analytic practices.

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Table 1

Indicators of Job Analytic Inaccuracy

Indicator	Definition	Operational Definition
Reliability		
Interrater Reliability	Index of the consistency of ratings across raters	Correlation and/or intraclass correlation (ICC) across raters reduced to a single rater using the Spearman Brown Prophecy formula
Interrater Agreement	Index of absolute agreement among raters	Percent agreement, Cohen's (1960) kappa, and/or James, Demaree, & Wolf's (1984) r_{wg}
Intrarater Reliability	Index of the consistency in the rank orders of items within the same rater	Correlation between the same or similar items within raters
Intrarater Agreement	Index of the amount of absolute agreement provided by the same rater across similar items	Percent agreement, Cohen's (1960) kappa, and/or James, Demaree, & Wolf's (1984) r_{wg}
Rate-rerate Reliability	Index of the correlation between the observed item ratings across more than one administration of those items	Correlation between rater responses across administrations
Data Quality		
Factor Structure Confirmation	Index of how well the hypothesized factor structure underlying a job analysis instrument fits the observed factor analytic results	Absolute value of the difference between the proposed number of factors and the observed number of factors[a]
Mean Ratings	Average job analysis ratings provided by the sample of incumbents across the entire instrument	Standardized mean job analytic ratings provided by the sample
Endorsement of Distractor Items	Index of the extent to which raters endorse bogus items or tasks that are not considered a part of the job in question	Average instances of distractor item endorsement within the sample being studied divided by the number of distractor items presented

Note. [a] Factor confirmation is operationalized such that accuracy is highest when this variable equals 0.

Table 2

Independent Variables

Independent Variable	Definition	Operational Definition
Contextual Variables:		
Organizational Size	Number of individuals employed by the organization	Coded as either 1) small (100 or less employees, 2) medium (101-499 employees), 3) large (500-999 employees), or 4) very large (1,000 employees or more)
Organizational Dispersion	Geographic dispersion of the organization	Coded as either 1) low (all operations in one location/city), 2) medium (operations in a few locations regionally), 3) high (operations in many locations nationally), or 4) very high (operations in many locations internationally)
Sample Characteristics:		
Demographic Variables:		
Age	Variability in age within SMEs asked to provide job analytic data	Standard deviation of age within the sample of SMEs
Gender	Variability in gender within SMEs asked to provide job analytic data	Absolute value of the difference between the percent of the sample that is male and 50% [a]
Race	Variability in race within SMEs asked to provide job analytic data	Gibbs and Martin's (1962) index of diversity $D = 1 - \sum_{i=1}^{n} (p_i)^2$
Tenure	Variability in tenure within SMEs asked to provide job analytic data	Standard deviation of tenure within the sample of SMEs

Table 2 continues

Table 2 Continued

Independent Variable	Definition	Operational Definition
Job Characteristics:		
Job Complexity	Rating of the amount of complexity involved in the job in question	Coded as either 1) low (hourly, clerical, and blue collar workers), 2) medium (lower to mid-level managers; jobs that require a Bachelor's degree), or 3) high (any profession as well as high level management; e.g., physician)
Interdependence	Rating of the amount of interdependence involved in the job in question	Coded as either 1) high (dealing with other organizational members is an essential and crucial part of doing the job), 2) medium (some dealing with other organizational members is necessary), or 3) low (dealing with other organizational members is not at all necessary in for job performance)[b]
# of Incumbents	Number of incumbents that hold the job title being analyzed	Recorded the actual number of incumbents
Characteristics of the Job Analysis:		
Personal Relevance of the Purpose of Analysis	Indication of the personal relevance of the purpose for conducting a job analysis	Coded as either 0) Not personally relevant (i.e., developing selection systems, developing certification procedures, and research purposes) or 1) personally relevant (i.e., developing training programs, determining compensation levels, developing promotional systems, developing performance appraisal measures, and job evaluation)
Type of Information Gathered	Type of data collected during analysis	Coded as either 1) worker-oriented, 2) task-oriented, or 3) blended information
Job Analytic Approach	Approach used (i.e., competency modeling or traditional approach)	Coded as either 0) does not mention the term 'competency' when describing the job analysis, or 1) mentions the term 'competency' when describing the job analysis
Method of Data Collection	Use of one or more methods for collecting job analysis information	Coded as either 1) used one method, or 2) used more than one method
Source of Information	Subject matter expert used to collect job analysis information	Coded as either 1) job analyst, 2) supervisor, 3) job incumbent, 4) student, 5) mixed source, or 6) other

Table 2 continues

Table 2 Continued

Characteristics of the Job Analysis:		
Independent Variable	Definition	Operational Definition
Rater Training	Whether or not training was provided to SMEs before they provided job analytic information	Coded as either 0) training not provided, or 1) training provided
Characteristics of the Job Analysis Instrument:		
Type of Measure	Source of job analytic inventory used to collect data	Coded as either 0) study specific measure, or 1) standardized, previously developed measure
Length	Number of items included in the job analysis inventory	Recorded the actual number of items in the job analysis inventory
Item Specificity	Level of specificity that job analysis inventory employs	Coded as either 1) task, 2) task cluster, 3) duty, or 4) job
Worker Characteristic	Type of KSAO collected during worker-oriented job analysis	Coded as either 1) Ability/Skill, 2) Knowledge, 3) Personality Trait, 4) Mixed, or 5) Other
Subjectivity of Rating Scale	Amount of inference required by the specific rating scale used	Coded as either 0) Objective Rating Scale (i.e., frequency, time spent, and perform/required by job), or 1) Subjective (i.e., importance, difficulty, and consequence of error)

Note. [a] Gender diversity is operationalized such that the sample is the most diverse when this variable equals 0.
[b] Code reflects Pritchard, Harrell, Diaz Granados, and Guzman's (2008) operational definition of interdependence.

Table 3

Main Effect Results

Indicator	# of Studies	*k*	*N*	Effect	*SD*	95% CI	χ^2
Reliability Indices							
Interrater Reliability	64	352	102519	.03	.08	[.03, .03]	710.12***
Correlation	43	181	81172	.01	.04	[.01, .01]	103.66
ICC	23	171	21347	.09	.16	[.07, .10]	525.61***
Interrater Agreement	21	62	2351	.64	.26	[.61, .66]	452.16***
Percent Agreement	9	20	763	.73	.14	[.69, .76]	71.27***
Cohen's Kappa	4	8	157	.64	.03	[.63, .66]	.41
r_{wg}	5	23	895	.58	.37	[.44, .73]	279.07***
Intrarater Reliability	6	13	3298	.01	.03	[.00, .02]	3.13
Intrarater Agreement	2	3	1372	.78	.29	[.50, 1.05]	702.32***
Rate-rerate Reliability	18	50	7516	.64	.09	[.63, .65]	182.36***
Quality Indices							
Factor Structure Confirmation	21	43	12345	2.90	3.72	[2.56, 3.25]	3101.38***
Mean Ratings	87	317	96999	.00	1.28	[-.03, .03]	158966.52***
Endorsement of Distractor Items	5	16	2519	.19	.29	[.08, .30]	225.46***

Note. *k* = number of effects. CI = confidence interval. ICC = intraclass correlation.

* $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 4

Weighted Least Squared Regression Results for Interrater Reliability

Moderator	*k*	β	R^2
Organizational Characteristics			
Organizational Size	193	.19	.03
Organizational Dispersion	201	-.16	.03
Sample Characteristics			
Age	-	-	-
Gender	63	-.66*	.43
Race	28	.47	.21
Tenure	4	.85	.73
Job Complexity	239	-.52***	.27
Interdependence	228	-.61***	.37
# of Incumbents	69	.34	.12
Methodological Characteristics			
Method of Data Collection	309	.05	.00
Length	299	-2.85***	.51
Length - Quadratic Effect		2.45***	

Note. k = number of effects. The beta weight associated with gender has been reversed for conceptual clarity.
* p <.05. ** p < .01. *** p < .0001.

Table 5

Weighted Least Squares Regression Results for Interrater Agreement

Moderator	*k*	β	R^2
Organizational Characteristics			
Organizational Size	20	-.40	.16
Organizational Dispersion	23	-.93***	.87
Sample Characteristics			
Age	4	.63	.40
Gender	6	.88	.77
Race	-	-	-
Tenure	-	-	-
Job Complexity	59	.24	.06
Interdependence	56	-.05	.00
# of Incumbents	4	-.98	.96
Methodological Characteristics			
Method of Data Collection	50	-.18	.03
Length	61	2.76*	.84
Length - Quadratic Effect		-1.87	

Note. k = number of effects. The beta weight associated with gender has been reversed for conceptual clarity.
* p <.05. ** p < .01. *** p < .0001.

Table 6

Weighted Least Squares Regression for Rate-rerate Reliability

Moderator	*k*	β	R^2
Organizational Characteristics			
Organizational Size	33	.00	.00
Organizational Dispersion	36	-.14	.02
Sample Characteristics			
Age	-	-	-
Gender	-	-	-
Race	-	-	-
Tenure	-	-	-
Job Complexity	18	.50	.25
Interdependence	24	.01	.00
# of Incumbents	-	-	-
Methodological Characteristics			
Method of Data Collection	44	-.38	.15
Length	35	-3.59	.16
Length - Quadratic Effect		3.66	

Note. *k* = number of effects.
* *p* <.05. ** *p* < .01. *** *p* < .0001.

Table 7

Weighted Least Squares Regression Results for Factor Structure Confirmation

Moderator	*k*	β	R^2
Organizational Characteristics			
Organizational Size	27	-.02	.00
Organizational Dispersion	27	-.95**	.90
Sample Characteristics			
Age	4	.99	.98
Gender	27	.48	.23
Race	8	-1.00***	1.00
Tenure	4	-1.00**	1.00
Job Complexity	34	-.94***	.88
Interdependence	32	-.08	.01
# of Incumbents	-	-	-
Methodological Characteristics			
Method of Data Collection	39	-.22	.05
Length	42	-.53	.38
Length - Quadratic Effect		-.09	

Note. k = number of effects. Beta weights for all variables except for gender have been reversed for conceptual clarity.
* p <.05. ** p < .01. *** p < .0001.

Table 8

Weighted Least Squares Regression Results for Distractor Item Endorsement

Moderator	*k*	β	R^2
Organizational Characteristics			
Organizational Size	-	-	-
Organizational Dispersion	7	-.42	.17
Sample Characteristics			
Age	-	-	-
Gender	15	-.61	.36
Race	12	.17	.03
Tenure	-	-	-
Job Complexity	15	-.43	.19
Interdependence	16	.55	.30
# of Incumbents	-	-	-
Methodological Characteristics	-	-	-
Method of Data Collection	-		-
Length	16	-1.72	.37
Length - Quadratic Effect		1.26	

Note. *k* = number of effects. The beta weight associated with gender has been reversed for conceptual clarity.
* p <.05. ** p < .01. *** p < .0001.

Table 9

Weighted Least Squares Regression Results for Mean Job Analytic Ratings

Moderator	*k*	β	R^2
Organizational Characteristics			
Organizational Size	193	-.60***	.37
Organizational Dispersion	210	-.39*	.15
Sample Characteristics			
Age	41	-.43	.19
Gender	168	-.25	.06
Race	99	-.28	.08
Tenure	29	.69*	.47
Job Complexity	227	.52***	.27
Interdependence	226	-.18	.03
# of Incumbents	301	-.76	.57
Methodological Characteristics			
Method of Data Collection	80	-.08	.01
Length	302	.08	.11
Length - Quadratic Effect		-.41	

Note. *k* = number of effects. The beta weight associated with gender has been reversed for conceptual clarity.
* p <.05. ** p < .01. *** p < .0001.

Table 10

Results of Subgroup Moderator Analysis of Interrater Reliability

Moderator	*k*	*n*	*effect*	*SD*	95% CI	χ^2
Purpose						
Compensation	4	305	.10	.20	[-.04, .23]	12.93**
Training	44	2906	.09	.12	[.05, .13]	42.83
Selection	47	3369	.26	.21	[.16, .37]	177.45***
Certification	2	633	.03	.04	[-.01, .06]	.80
Research	152	79280	.02	.05	[.01, .02]	215.61***
Mixed Purpose	16	692	.27	.03	[.24, .30]	.72
Other	16	10112	.01	.02	[.00, .01]	4.11
Personal Relevance						
Not Relevant	254	86586	.03	.09	[.02, .03]	627.16***
Relevant	27	10711	.03	.08	[.01, .04]	61.61***
Type of Information						
Task	165	39489	.04	.07	[.03, .04]	145.60
Mixed	35	14853	.03	.14	[.02, .05]	311.39***
Worker	123	44601	.02	.06	[.01, .02]	217.28***
Source of the Information						
Incumbent	105	73257	.01	.04	[.00, .01]	124.10
Supervisor	85	12695	.07	.16	[.04, .11]	341.82***
Job Analyst	41	568	.23	.17	[.21, .26]	17.87
Student	35	1770	.14	.17	[.11, .17]	53.41*
Mixed	60	4068	.09	.10	[.08, .10]	40.46
Rater Training						
No Training	235	87993	.02	.08	[.02, .02]	566.89***
Training	68	2974	.11	.16	[.09, .14]	78.54
Source of the Survey						
Study Specific	134	71138	.01	.08	[.01, .02]	457.41***
Standardized	156	9172	.12	.12	[.11, .13]	135.88
Item Specificity						
Task	136	17701	.05	.09	[.04, .05]	138.96
Task Cluster	3	5549	.08	.22	[-.07, .22]	278.07***
Duty	26	6507	.01	.04	[-.01, .02]	11.20
Job	29	1471	.11	.14	[.09, .13]	30.22

Table continues

Table 10 Continued

Moderator	*k*	*n*	*effect*	*SD*	95% CI	χ^2
Worker Characteristic						
Mix	35	1495	.17	.14	[.14, .20]	30.17
Other	30	30263	.01	.04	[.00, .02]	57.10**
Ability/Skill	29	13591	.00	.02	[.00, .01]	6.19
Personality	13	449	.20	.21	[-.01, .40]	21.85*
Subjectivity of the Rating Scale						
Objective	81	13960	.07	.05	[.06, .07]	34.97
Subjective	165	80075	.02	.08	[.02, .03]	555.11*
Rating Scale						
Frequency	5	306	.19	.04	[.16, .22]	.62
Time	28	5881	.05	.03	[.04, .05]	4.92
Importance	81	76284	.01	.05	[.01, .01]	166.29***
Difficulty	4	226	.14	.10	[.05, .22]	2.13
Mixed	5	2310	.01	.02	[.00, .01]	.57
Required	33	2562	.04	.09	[.01, .07]	22.77
Error	25	1093	.16	.06	[.13, .20]	3.63
Learn	25	1834	.36	.25	[.26, .46]	155.88***
Other	47	1790	.09	.17	[.06, .11]	55.54

Note. Moderator variables and moderator levels that could not be tested due to insufficient studies are not included in the table. *k* = number of effects. CI = confidence interval.

* $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 11

Results of Subgroup Moderator Analyses of Interrater Agreement

Moderator	*k*	*n*	*effect*	*SD*	95% CI	χ^2
Purpose						
Selection	4	58	.41	.13	[.29, .53]	1.45
Research	23	1145	.61	.28	[.54, .68]	229.81***
Other	4	315	.53	.15	[.44, .62]	12.78**
Personal Relevance						
Not Relevant	31	1542	.60	.27	[.57, .64]	282.88***
Relevant	8	190	.64	.05	[.59, .69]	1.62
Type of Information						
Task	27	1318	.53	.15	[.49, .57]	202.91***
Mixed	8	132	.68	.03	[.67, .70]	.44
Worker	32	899	.79	.28	[.74, .83]	135.52***
Job Analytic Approach						
Traditional Approach	55	1953	.60	.27	[.57, .63]	354.86***
Competency	7	398	.80	.08	[.72, .88]	22.04***
Source of the Information						
Incumbent	14	759	.61	.26	[.55, .66]	128.09***
Job Analyst	15	241	.50	.26	[.44, .56]	28.34*
Student	10	292	.32	.28	[.18, .45]	27.73**
Mixed	12	798	.73	.14	[.68, .79]	71.17***
Source of the Survey						
Study Specific	26	1052	.54	.32	[.45, .63]	214.70***
Standardized	33	892	.71	.20	[.68, .74]	144.17***
Item Specificity						
Task	18	1035	.65	.18	[.62, .68]	94.02***
Job	17	706	.86	.05	[.83, .89]	30.35*
Worker Characteristic						
Other	6	24	.68	.13	[.60, .76]	1.43
Ability/Skill	4	95	.75	.14	[.62, .88]	9.59*
Subjectivity of the Rating Scale						
Objective	14	692	.66	.13	[.61, .71]	34.10*
Subjective	34	987	.80	.15	[.77, .82]	165.05*

Table continues

Table 11 Continued

Moderator	*k*	*n*	*effect*	*SD*	95% CI	χ^2
Rating Scale						
Time	4	311	.55	.16	[.45, .65]	16.05**
Importance	11	571	.79	.12	[.73, .85]	58.33***
Mixed	4	368	.59	.20	[.46, .72]	36.21***
Other	25	451	.81	.18	[.78, .85]	130.69***

Note. Moderator variables and moderator levels that could not be tested due to insufficient studies are not included in the table. *k* = number of effects. CI = confidence interval.
* $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 12

Results of Subgroup Moderator Analyses of Rate-Rerate Reliability

Moderator	*k*	*n*	*effect*	*SD*	95% CI	χ^2
Purpose						
Research	20	2927	.66	.04	[.64, .67]	14.75
Other	8	738	.80	.06	[.78, .82]	21.63**
Personal Relevance						
Not Relevant	27	3745	.68	.06	[.67, .69]	54.33***
Relevant	6	162	.88	.03	[.85, .91]	3.55
Type of Information						
Task	27	2950	.69	.07	[.68, .70]	57.21***
Mixed	11	1072	.66	.01	[.65, .68]	.74
Worker	8	2854	.56	.06	[.52, .60]	23.60**
Source of the Information						
Incumbent	39	6558	.62	.08	[.61, .64]	119.07***
Supervisor	2	82	.79	.08	[.71, .87]	3.67
Job Analyst	2	40	.78	.06	[.72, .84]	1.05
Source of the Survey						
Study Specific	25	5173	.60	.07	[.59, .62]	66.59***
Standardized	10	781	.77	.06	[.74, .80]	15.8
Item Specificity						
Task	15	3387	.62	.07	[.60, .64]	45.06***
Duty	4	1465	.57	.06	[.51, .62]	10.80*
Job	3	104	.86	.03	[.83, .90]	1.89
Subjectivity of the Rating Scale						
Objective	11	1427	.73	.05	[.72, .75]	17.2
Subjective	15	1387	.65	.16	[.61, .68]	108.29*
Rating Scale						
Frequency	3	636	.72	.05	[.69, .75]	6.34*
Time	4	655	.72	.05	[.70, .74]	6.18
Importance	10	742	.78	.06	[.75, .81]	16.83
Difficulty	2	554	.49	.05	[.44, .53]	2.17
Mixed	7	1777	.58	.06	[.56, .60]	16.01*
Other	5	139	.66	.25	[.54, .78]	27.70***

Note. Moderator variables and moderator levels that could not be tested due to insufficient studies are not included in the table. *k* = number of effects. CI = confidence interval.

* $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 13

Results of Subgroup Moderator Analyses of Factor Structure Confirmation

Moderator	*k*	*n*	*effect*	*SD*	95% CI	χ^2
Purpose						
Research	8	2163	3.25	2.31	[2.61, 3.88]	126.79***
Other	4	834	1.10	.83	[.28, 1.92]	12945.55***
Personal Relevance						
Not Relevant	26	4848	3.00	2.03	[2.61, 3.40]	311.50***
Relevant	6	874	1.10	.81	[.56, 1.63]	14289.25***
Type of Information						
Task	29	7407	4.63	3.90	[4.01, 5.26]	269.40***
Mixed	6	1330	.24	.99	[-.24, .73]	1465.36***
Worker	7	3159	.09	.20	[.00, .19]	125.33***
Source of the Information						
Incumbent	27	10742	2.03	2.86	[1.68, 2.38]	8913.66***
Job Analyst	6	642	5.69	1.21	[6.01, 5.37]	.95
Source of the Survey						
Study Specific	12	4975	1.16	2.02	[.67, 1.65]	169664.39***
Standardized	26	4020	4.72	4.11	[3.85, 5.59]	150.10***
Item Specificity						
Task	26	4587	4.85	4.89	[3.81, 5.89]	216.73***
Duty	5	975	3.94	2.71	[2.72, 5.16]	33.90***
Subjectivity of the Rating Scale						
Objective	10	3591	1.61	3.78	[.13, 3.09]	20373.84*
Subjective	24	5860	4.72	3.64	[4.14, 5.30]	171.46*
Rating Scale						
Time	10	3591	1.61	3.78	[.13, 3.09]	20373.84***
Importance	12	2866	5.66	4.75	[4.58, 6.74]	67.29***
Mixed	3	2281	3.80	.40	[3.59, 4.01]	2.05
Other	2	635	5.69	1.33	[5.90, 5.47]	1.15

Note. Moderator variables and moderator levels that could not be tested due to insufficient studies are not included in the table. *k* = number of effects. CI = confidence interval.

* $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 14

Results of Subgroup Moderator Analyses of Distractor Item Endorsement

Moderator	*k*	*n*	*effect*	*SD*	95% CI	χ^2
Personal Relevance						
Not Relevant	3	501	.68	.34	[.35, 1.01]	198.27***
Relevant	10	1640	.06	.02	[.04, .08]	.76
Source of the Information						
Incumbent	12	986	.08	.06	[.04, .11]	3.04
Mixed	3	1533	.26	.35	[-.08, .60]	215.02***
Subjectivity of the Rating Scale						
Objective	4	329	.42	.36	[.07, .77]	61.97*
Subjective	10	860	.27	.40	[.01, .53]	157.95*
Rating Scale						
Time	4	329	.42	.36	[.07, .77]	61.97***
Importance	10	860	.27	.40	[.01, .53]	157.95***
Mixed	2	1330	.08	.03	[.05, .11]	1.09

Note. Moderator variables and moderator levels that could not be tested due to insufficient studies are not included in the table. *k* = number of effects. CI = confidence interval.
* $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 15

Results of Subgroup Moderator Analyses of Mean Job Analytic Ratings

Moderator	*k*	*n*	*effect*	*SD*	95% CI	χ^2
Purpose						
Training	82	4842	-1.59	4.10	[-2.32, -.86]	35117.01***
Selection	54	4973	-6.21	7.25	[-7.73, -4.69]	185.17***
Certification	11	5074	1.49	1.23	[1.14, 1.83]	5186.99***
Research	61	64150	-6.52	9.00	[-7.17, -5.87]	3014.31***
Mixed Purpose	24	4793	.31	2.14	[-.52, 1.15]	26930.34***
Other	10	2769	-1.25	3.67	[-2.45, -.05]	118333.69***
Personal Relevance						
Not Relevant	217	81466	-5.63	7.59	[-5.88, -5.38]	4983.29***
Relevant	27	5395	.76	1.08	[.41, 1.11]	35200.02***
Type of Information						
Task	156	37407	-.78	1.29	[-.83, -.73]	400734.80***
Mixed	39	9021	.56	1.04	[.42, .69]	20629.55***
Worker	119	48909	-.25	1.09	[-.31, -.18]	65392.65***
Job Analytic Approach						
Traditional	299	91634	-.42	1.23	[-.45, -.38]	202892.34***
Competency	15	5127	.67	.59	[.56, .78]	5969.82***
Source of the Information						
Incumbent	52	3670	-.40	.43	[-.54, -.26]	965.12***
Supervisor	82	5156	-.70	1.55	[-.85, -.55]	47197.09***
Job Analyst	160	84020	-.38	1.26	[-.42, -.34]	181844.83***
Student	7	691	-.46	.51	[-.71, -.21]	289.63***
Mixed	15	1829	.68	.59	[.56, .81]	2250.39***
Rater Training						
No Training	275	93080	-.38	1.24	[-.41, -.35]	194929.03***
Training	32	1555	-.29	.96	[-.56, -.02]	1716.47***
Source of the Survey						
Study Specific	90	66984	-.65	1.24	[-.74, -.55]	305468.88***
Standardized	213	27814	.35	.90	[.32, .38]	29261.03***

Table continues

Table 15 (continued)

Moderator	*k*	*n*	*effect*	*SD*	95% CI	χ^2
Item Specificity						
Task	158	14894	-.19	.78	[-.24, -.15]	9719.34***
Task Cluster	2	5507	-2.53	.07	[-2.60, -2.46]	1.03
Duty	30	18947	-.76	1.30	[-.91, -.61]	178627.85***
Job	17	3803	.08	.54	[-.05, .21]	1118.74***
Worker Characteristic						
Mix	27	5036	.54	.85	[.38, .71]	7281.25***
Other	13	17490	-.21	1.84	[-.61, .19]	64999.22***
Ability/Skill	42	17713	-.18	.95	[-.31, -.04]	16923.27***
Knowledge	10	11029	.18	.45	[-.04, .40]	2423.74***
Personality	10	1909	-.63	.32	[-.73, -.53]	530.93***
Subjectivity of the Rating Scale						
Objective	71	9662	-.25	.69	[-.29, -.21]	5198.85*
Subjective	226	84564	-.36	1.30	[-.40, -.33]	190757.96*
Rating Scale						
Frequency	27	3254	.00	.76	[-.09, .10]	1858.93***
Time	22	2753	-.68	.38	[-.76, -.59]	1332.05***
Importance	131	75263	-.32	1.34	[-.36, -.28]	166714.50***
Difficulty	12	702	-.87	.80	[-1.26, -.48]	7944.17***
Perform	8	638	-.26	.65	[-.68, .16]	306.56***
Mixed	13	1068	-.85	.90	[-1.14, -.55]	10634.75***
Required	10	2364	-.10	.52	[-.30, .10]	644.85***
Error	24	1349	-.41	.84	[-.96, .14]	1369.59***
Learn	24	2308	-1.24	.72	[-1.59, -.89]	4174.31***
Other	43	7036	-.39	.84	[-.52, -.26]	6977.90***

Note. Moderator variables and moderator levels that could not be tested due to insufficient studies are not included in the table. *k* = number of effects. CI = confidence interval.
* $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 16

Summary of Study Findings by Source of Inaccuracy

Moderator/Source of Inaccuracy	Interrater Reliability	Interrater Agreement	Rate-Rerate	Factor Structure	Distractor Items	Mean Ratings
Organizational Characteristic						
Organizational Size						RQ1
Organizational Dispersion		RQ2		RQ2		RQ2
Sample Characteristic						
Age	n/a		n/a	H1: X	n/a	
Gender	H1: +		n/a			
Race		n/a	n/a	H1: +		
Tenure		n/a	n/a	H1: +	n/a	RQ3
Job Complexity	H2: +			H2: +		RQ4
Interdependence	H3: +					
# of Incumbents			n/a	n/a	n/a	
Methodological Characteristic						
Purpose of Analysis		H4: +	H4: +	H4: +	H4: +	H5: +
Type of Information Gathered	H6: +	H6: X	H6: +	H6: X	n/a	RQ7
Job Analytic Approach	n/a	H7: X	n/a	n/a	n/a	RQ8
Method of Data Collection					n/a	
Source of Information	H8: +	H8: X	H8: +	H8: X	n/a	RQ10
Rater Training	RQ11	n/a	n/a	n/a	n/a	RQ11
Type of Measure	RQ12	RQ12	RQ12	RQ12	n/a	RQ12
Length	H9: X	H9: X				
Item Specificity	H10: X	H10: X	H10: X	H10: X	n/a	RQ14
Worker Characteristic	RQ15	n/a	n/a	n/a	n/a	RQ15
Rating Scale Subjectivity	H11: +	H11: X	H11: +	H11: +	H11: X	RQ16

Note. References to research questions and hypotheses denote significant effects. Hypotheses followed by a + indicate that the hypothesis was supported by that significant effect. Hypotheses followed by an X indicate that the hypothesis was not supported by that significant effect. Untestable effects are denoted by n/a.

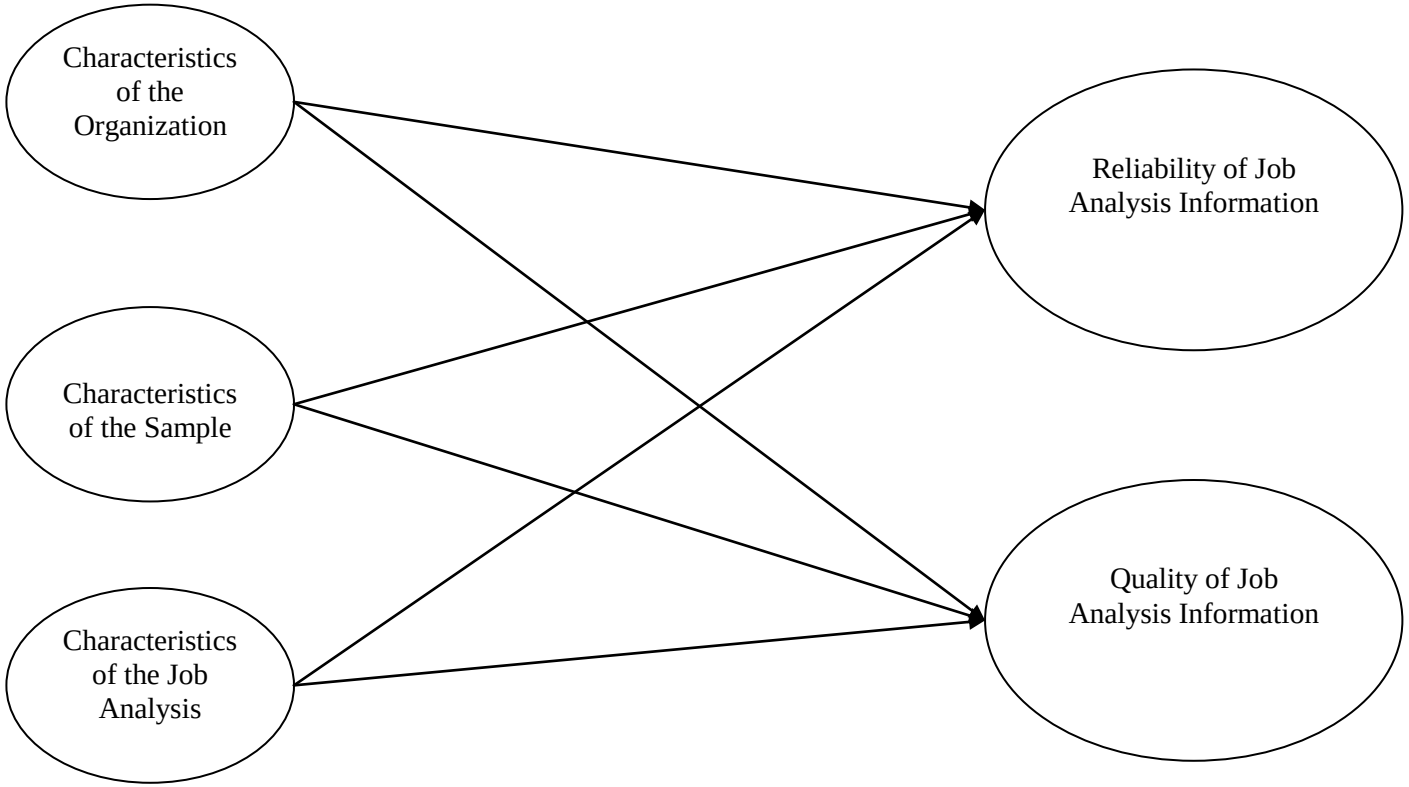

Figure 1. *Sources of job analytic inaccuracy.*