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Personnel Selection

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Summary and Keywords

Personnel selection is one of the most critical processes in the study of human work behavior because it determines the efficacy of many other issues of human resource management (e.g., training, productivity, and culture). From this perspective, personnel selection is a process of decision-making, and its main objective is to predict the future performance of potential employees. In order to achieve this objective, personnel selection identifies the individual requirements of job performance and uses a variety of assessment procedures, including cognitive ability tests, personality inventories, interviews, job knowledge tests, situational judgment tests, job experience, work sample tests, assessment centers, biodata, and reference checks. Using the best combination of predictors, currently, scientific personnel selection is capable of predicting and explaining over 60% of job performance variance based on individual differences.

Keywords: personnel selection, validity, job performance, contextual performance, counterproductive behavior at work, cognitive test, personality, assessment centers, applicant reactions, combining predictors

Personnel selection is one of the most critical processes in the study of human work behavior because it determines the efficacy of many other issues of human resource management (Guion, 1998; Salgado, Viswesvaran, & Ones, 2001). Personnel selection is used by organizations to decide which of the applicants for a job is the most appropriate for a particular position. In this sense, it is a decision-making process about the suitability of the candidates (Salgado & Moscoso, 2008).

As a scientific discipline, it began around 1900, when the principles and methods of psychology were applied to personnel decisions in Europe and the United States (Salgado, Anderson, & Hülshager, 2010; Vinchur & Koppes Bryan, 2012). To this regard, as Vinchur and Koppes Bryan (2012) noted, the advances in the area are intimately tied to the advances in assessment and measurement procedures and in statistical developments.

This applied process requires carrying out several steps. First, an analysis of the job must be done in order to ascertain the specific characteristics of the position (e.g., tasks and

duties). The second step involves identifying the specific individual requirements (e.g., cognitive abilities, job knowledge, skills, personality, experience, and other characteristics) needed for carrying out efficiently specified tasks and duties. This information is typically obtained through job analysis (García-Izquierdo, Díaz-Vilela, & Moscoso, 2015; Pearlman & Sanchez, 2010; Sanchez & Levine, 2012). Sometimes, these individual characteristics are called competencies (e.g., Schippman et al., 2000). The third step determines the degree to which candidates meet the individual requirements identified in step 2. In other words, candidates are evaluated using a variety of assessment procedures (e.g., cognitive test, job knowledge test, interview, assessment center, among others) to estimate their proficiency in requirements. Finally, the data collected can be used to predict future organizational behavior (e.g., job performance, training proficiency, turnover, promotions, career success, leadership potential, and many others). These organizational behaviors are typically named criteria. Therefore, personnel selection is a predictive process consisting of two kinds of variables: (a) predictors, that is, the assessment procedures; and (b) criteria, that is, the employee's behavior and the outcomes the organization seeks to obtain.

Nevertheless, we should not overlook that candidates also make decisions, that is, together with the organizational perspective, the candidate perspective must also be considered (e.g., the applicant perceptions and reactions), regarding the hiring process (Anderson, Born, & Cunningham-Snell, 2001; Anderson, Salgado, & Hülsheger, 2010).

This article reviews and summarizes the research literature on personnel selection and is organized into four main sections. The first section examines the different approaches to personnel selection. The second section reviews the most relevant assessment procedures according to their psychometric properties. Consequently, in the second section, the validity of cognitive ability tests, personality inventories, interviews, job knowledge tests, work sample tests, assessment centers, and other procedures are summarized. The third section reviews applicant perceptions and reactions. The fourth section presents the issue of combining data from different predictors (i.e., multiple prediction, incremental validity) to optimize efficacy. Finally, conclusions are provided.

Performance Measurement and Approaches to Personnel Selection

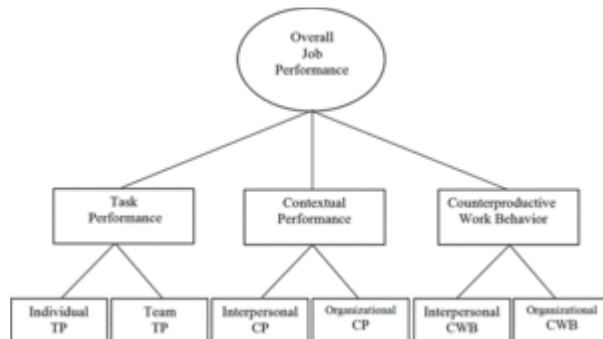
What is to be predicted? What behaviors and outcomes are relevant for organizations and candidates? Based on what we know currently about the procedures used in hiring decisions, these are probably the most crucial questions for an effective personnel

selection process. These two questions underscore the issue of performance measurement on the one hand, and the perspectives on the selection process on the other.

For a century, it was believed that the aim of personnel selection was to predict overall job performance and that overall job performance was a single entity, whether assessed using a single global dimension or as a composite of multiple dimensions (Salgado, 2015; Schmidt, Hunter, & Ones, 1992). However, today we know that some assessment procedures can predict some performance-related behaviors and outcomes (e.g., task performance) very efficiently but they are poor predictors of other performance-related behaviors (e.g., contextual performance, counterproductive work behaviors, leadership potential, and so on). Thus, the first step in personnel selection is to determine the performance criteria for the future employees.

There is currently a large consensus among researchers that the job performance domain includes at least three main subdomains: task proficiency, contextual (citizenship) performance, and counterproductive performance. Task performance is defined as the proficiency with which employees perform core technical activities that are relevant for the job (Borman, Bryant, & Dorio, 2010). Task performance can be subdivided into individual performance and work-team performance. Contextual performance (also called citizenship performance) relates to the contributions of the employee to the organizational, social, and psychological environment to help to accomplish organizational goals (Borman et al., 2001; Dorsey, Cortina, & Luchman, 2010; Hoffman & Dilchert, 2012). Empirical evidence has shown that there is some degree of interrelationship among the three subdomains (Conway, 1996). Contextual performance has been subdivided into two narrower dimensions: interpersonal performance and job dedication (Van Scotter & Motowidlo, 1996). Counterproductive performance has been defined as any intentional behavior of an employee viewed by the organization as contrary to its legitimate interests (Sackett & De Vore, 2001, p. 145). Two further subdimensions of counterproductive performance have been identified, that is, a subdimension related to interpersonal counterproductive behaviors, for example, abusive supervision, aggression, bullying; and a subdimension related to organizational counterproductive behaviors, for example, hurts, voluntary absenteeism, low effort (Hoffman & Dilchert, 2012; Rotundo & Spector, 2010). There is also meta-analytic evidence that, after controlling for halo error and reliability, there is a general factor in job performance rating (Viswesvaran, Schmidt, & Ones, 2005). This factor explained 60% of the total variance. With regard to the interrater reliability of job performance ratings, .52 is the average value found in independent meta-analytic studies for overall job performance (Salgado, *IN PRESS*; Salgado et al., 2003B; Salgado & Moscoso, 1996;

Viswesvaran, Ones, & Schmidt, 1996). Figure 1 represents the performance domain and its dimensions and subdimensions.



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Figure 1. Dimensional Structure of Job Performance

In addition to criterion, a further issue to be appraised refers to the theoretical traditions related to personnel selection. Several authors have identified two main perspectives in personnel selection (Anderson, Lievens, van Dam, & Ryan, 2004; Anderson, Salgado,

Schinkel, & Cunningham-Snell, 2008; Schuler, 1993). The first perspective is the predictivist, which in essence aims to establish the *person-job fit*. According to this perspective, selection procedures are predictors of future job performance, and candidates are seen as “subjects” to selection procedures. The second perspective is constructivist, emphasizing that candidates, as well as organizations, make decisions in personnel selection. According to Anderson and his colleagues, the constructivist perspective sees selection as an opportunity for information exchange and to explore if a future working relationship would be viable. Therefore, from the constructivist perspective, personnel selection focuses not only on ensuring person-job fit but also *person-organization fit* and *team-organization fit*. In this context, person-organization fit is conceptualized as the adjustment between the candidate’s values and the organizational values and culture, whereas person-team fit is conceptualized as the adjustment between the candidate’s competencies, attitudes, and abilities, and the immediate working environment of the group. The constructivist perspective is closely related to the Attraction-Selection-Attrition (ASA) paradigm (Schneider, 1987; Schneider, Goldstein, & Smith, 1995). According to the ASA paradigm, “the people make the place.” This means that the attributes of employees (e.g., abilities and personality) are the most relevant factors of job performance and that candidates are differentially attracted to jobs. On their part, organizations try to select employees they see compatible with organizational culture and climate and that can be compatible for a number of different jobs. Over time, employees who do not fit in well are more likely to leave. The consequence of this process is a homogenization of employees’ characteristics who work at the organization.

Personnel Selection Procedures

Regardless of which selection approach is used, that is, the predictivist or the constructivist perspective, the appropriateness of the hiring decision will depend upon the criterion-related validity of assessment procedures used for making decisions. As for recent estimates on the criterion-related validity of the procedures most commonly used in practice, the following sections will report the validity estimates provided for the most robust studies of validity generalization, based on the psychometric meta-analysis methods of Hunter and Schmidt (2004; Schmidt & Hunter, 2014). In all likelihood, psychometric meta-analysis has been the most significant methodological development in work and organizational psychology and in personnel selection for the last 40 years. Psychometric meta-analysis can be defined as a quantitative integration of multiple research results that correct measurement error, sampling error, and several other artifactual errors, providing the most robust estimate of the operational validity of selection procedures.

Several comprehensive reviews of the validity of personnel procedures have been published in the last 15 years (e.g., Salgado & Moscoso, 2008; Salgado, Viswesvaran, & Ones, 2001; Schmidt & Hunter, 1998). The current review will focus on the procedures most commonly used in practice, and on the most recent criterion-related validity evidence. Selection procedures can be classified by two types: procedures for assessing constructs and procedures that are assessment methods (Hunter & Hunter, 1984). The main difference between a construct and an assessment method resides in the fact that the latter consists in grouping several constructs or measures. In other words, an assessment method is an aggregate of other variables. More recently, assessment procedures have been classified in terms of reflective measures and formative measures (Edwards & Bagozzi, 2000). The first type of measures includes the procedures for assessing constructs (e.g., cognitive test, job experience, and personality inventories), and the second type of measures are the assessment methods (e.g., interviews, situational judgment tests, and assessment centers). Using Hunter and Hunter's (1984) and Edwards and Bagozzi's (2000) classifications as the basis for subdividing the different procedures, the criterion-related validity of the personnel procedures is presented in two subsections.

Criterion-Related Validity of Reflective-Assessment (Constructs) Procedures

The findings of the meta-analyses are summarized in Table 1, which shows the estimate of operative validity for the most common reflective procedures used in personnel selection

for predicting overall job performance. It should be noted that the operative validity was estimated using the correlation between a predictor and a criterion after correction of artifactual errors. Typically, the observed correlation is corrected for measurement error in the criterion measure, and range restriction in the predictor.

Table 1. Operational validity estimates of reflective-assessment procedures

Criterion	Procedure	Validity
Overall Job Performance	General Cognitive Ability	.62
	Numerical Ability	.52
	Spatial Ability	.51
	Perceptual Ability	.52
	Verbal Ability	.38
	Memory	.56
	Conscientiousness	.39
	Emotional Stability	.20
	Extroversion	.12
	Openness	.22
	Agreeableness	.16
	Job Experience	.25
	Task Performance	General Cognitive Ability
Conscientiousness		.25
Emotional Stability		.08
Extroversion		.09
Openness		.12
Agreeableness		.10

	Job Experience	.25
Contextual Performance	General Cognitive Ability	.24
	Conscientiousness	.32
	Emotional Stability	.16
	Extroversion	.22
	Openness	.03
	Agreeableness	.18
Overall Counterproductive Work Behavior	General Cognitive Ability	-.02
	Conscientiousness	-.34
	Emotional Stability	-.15
	Extroversion	-.14
	Openness	.02
	Agreeableness	-.33

General and Specific Cognitive Ability Tests

General cognitive ability (GCA) can be defined as the capacity of a person to learn some material rapidly and accurately in optimal conditions of instruction. Therefore, less time taken and greater accuracy reflect greater GCA. There are several structural models of cognitive ability, most of them consisting of a general cognitive ability and several specific cognitive abilities (see Salgado, *IN PRESS*, for a comprehensive review). Among the specific cognitive abilities most frequently used in personnel selection we find abstract reasoning, spatial-mechanical reasoning, verbal reasoning, numerical reasoning, perceptual ability, and memory; but there are many other specific abilities. For example, the taxonomy of Fleishman and Reilly (1992) included inductive and deductive reasoning, verbal fluency, selective attention, and vigilance, among others.

Research on the criterion-related validity of cognitive ability measures in personnel selection is divided in two main approaches (see Salgado, *IN PRESS*; Schmitt, 2014, for exhaustive reviews). One approach contends that specific cognitive abilities do not add validity beyond the validity of GCA. In contrast, the other approach sustains that specific cognitive abilities can show incremental validity beyond GCA (e.g., Lang et al., 2010).

The meta-analytic findings across the globe obtained over the last 35 years have demonstrated that (1) CGA tests or a combination of several specific cognitive ability tests are the most valid predictor of overall job performance for all types of occupations (Hunter, Schmidt, & Le, 2006; Salgado et al., 2003A; Schmidt, Oh, & Le, 2006), and that .62 is the best estimate of operational validity; (2) The sizes of the estimates of criterion-related operational validity are similar across countries (Salgado, *IN PRESS*; Salgado & Anderson, 2003); (3) Job complexity is an important moderator of the validity of cognitive ability tests (Hunter & Hunter, 1984; Hunter et al., 2006; Salgado et al., 2003A; Schmidt et al., 2006); (4) Specific cognitive tests are also valid predictors of overall performance, but their validity is smaller than the GCA validity (Salgado et al., 2003B); (5) Cognitive tests are the most valid predictors of task performance, but they are less valid for predicting contextual performance, and they are not valid predictors of counterproductive work behavior (Gonzalez-Mule et al., 2014); (6) Cognitive tests show evidence of ethnic differences but they do not produce differential prediction (Berry et al., 2014).

Personality Inventories

The recent advances in the domain of personality at work have been largely due to the use of a construct-oriented approach in which the Five Factor Model of personality has become the preferred model for Work and Organizational Psychology researchers (Hough & Ones, 2001). The seminal work by Barrick and Mount (1991), Hough (1992), and Tett et al. (1991) was crucial for demonstrating that personality dimensions were relevant predictors of overall job performance and, on the basis of this pioneering research, many studies were conducted in the following years. Furthermore, many surveys conducted around the world since the 1950s have shown that practitioners typically included personality measures in the personnel selection processes.

In the last 25 years, many hundreds of primary studies and dozens of meta-analyses have examined the validity of personality measures as predictors in personnel selection. The FFM proved to be a successful taxonomy for classifying the various measures included in validity studies, and we now have a better understanding of the validity of the Big Five.

Based on the best meta-analytical data available, the following conclusions can be drawn: (1) The taxonomy of the personality traits derived from the FFM has proved to be a very useful framework for organizing the various single measures and is now accepted as the

paradigm in the field. The use of this taxonomy allowed personnel selection researchers to adequately respond to the concerns of Ghiselli (1966; Schmitt et al., 1984), Guion and Gottier (1965), and Schmitt et al. (1984) regarding the lack of a widely accepted personality model; (2) Conscientiousness is the best personality predictor of job performance and counterproductive behaviors, and it has shown validity generalization across samples, occupations, and countries. Operational validity of conscientiousness was found to be .39 when a quasi-ipsative forced-choice format was used (Salgado, Anderson, & Tauriz, 2015; Salgado & Tauriz, 2014); (3) Emotional stability was the second most relevant personality predictor of job performance and counterproductive work behaviors, (4) Conscientiousness, emotional stability, and agreeableness are the most valid predictors of overall counterproductive behaviors, interpersonally oriented counterproductive behaviors, and organizationally oriented counterproductive behaviors (Berry et al., 2007); (5) Conscientiousness, emotional stability, and agreeableness showed incremental validity over GCA for predicting overall job performance (Salgado & De Fruyt, 2006); (6) The format of the personality inventory is an important moderator of the criterion-related validity of the Big Five dimensions, so that the validity increases dramatically when quasi-ipsative forced-choice formats are used (Salgado, Anderson, & Tauriz, 2015; Salgado & Tauriz, 2014); and (7) The facets of the Big Five do not show evidence of criterion-related validity for predicting job performance when the validity of the factor is residualized (Salgado et al., 2015; Salgado, Moscoso, & Berges, 2013).

With regard to the criterion-oriented personality scales (COPS), meta-analyses have shown they were predictors of job performance and counterproductive behaviors. The most researched COPS were integrity tests. Technically, these are compounds (i.e., formative procedures), but they are included here as they include personality constructs only. The validity of personality-based integrity tests has been estimated at .37 for predicting job performance, and .42 for overall counterproductive behaviors (Ones, Viswesvaran, & Schmidt, 1993). The nomological net of these measures suggests hypotheses for explaining why they predict job performance and counterproductivity. Integrity tests have been found to mainly consist of conscientiousness, emotional stability, and agreeableness (Ones et al., 1993; Ones & Viswesvaran, 2001). Thus, the joint effect of these three basic personality dimensions explains the large validity of this personality measure.

The conclusions of the cumulated research is that the Big Five personality dimensions are important variables for predicting and explaining overall job performance, task performance, contextual performance, and counterproductive work behaviors (see Judge et al., 2013; and Salgado, Moscoso, & Anderson, 2013, for a review), and that personality inventories measure variables that are not assessed by other selection methods, and hence provide unique and non-overlapping variance for explaining the criterion space.

Consequently, practitioners in personnel selection can confidently use them for making personnel decisions.

Job Experience

In the practice of personnel selection, job experience is usually conceptualized as the number of years of experience on the same or similar job (McDaniel, Schmidt, & Hunter, 1988). Therefore, the length of service is used as a proxy of the experience on the job. Notwithstanding, this measure conveys no information on past performance of the job (Schmidt & Hunter, 1998).

Schmidt and Hunter (1998) indicated that the average operational validity of job experience was .25. In another meta-analysis, Schmidt, Hunter, and Outerbridge (1986) found a nonlinear relationship between job experience and job performance. Job performance increased linearly up to five years of job experience, and after that, the relationship became increasingly horizontal. When the amount of job experience was five years or less, the operational validity was .33 for predicting supervisory ratings of job performance (Schmidt et al., 1986).

Criterion-Related Validity of Formative-Assessment (Methods) Procedures

The findings of the meta-analyses for the most common formative measures used in personnel selection are shown in Table 2, which includes the operational validity of three types of employment interviews, work sample test, job knowledge test, situational judgment test, assessment center, biodata, and reference checks.

Table 2. Operational validity estimates of formative-assessment procedures

Criterion	Procedure	Validity
Overall Job Performance	Behavioral Structured Interview	.62
	Conventional Structured Interview	.37
	Unstructured Employment Interview	.20
	Work Sample Test	.33
	Job Knowledge Tests	.45
	Situational Judgment Test	.26
	Assessment Center	.37
	Biodata	.33
	Reference Check	.26

Employment Interview

In numerous surveys across many countries, the interview showed to be the most extensively used procedure for personnel selection (Salgado et al., 2001). These surveys show that practically all candidates must get through at least one interview during the hiring process. For this reason, the employment interview can be considered the foremost standard formative-assessment procedure.

Since 1984, a number of meta-analyses have examined both criterion-oriented validity as well as construct validity evidence in the selection interview. Prior to 1984, several narrative reviews on the empirical data regarding the reliability and validity of the interview concluded that the employment interview was unreliable and that its validity was practically zero (see Moscoso, 2000). The first meta-analysis of the criterion-related validity of the interview (Hunter & Hunter, 1984) agreed with this conclusion and showed that validity was very small (operational validity of .14). This raised the paradox that the most commonly used procedure for predicting applicant's job performance was incapable of predicting it.

However, research conducted during the last 25 years has shown that the selection interview was not a single and unitary method. Employment interviews have been classified using a twofold scheme of the structure and content of the questions (Salgado & Moscoso, 2002). These authors found three main types of interviews: unstructured interviews, conventional structured interviews, and behavioral structured interviews (other classifications were suggested by Huffcut, Roth, & McDaniel, 1996; and McDaniel et al., 1994). Unstructured interviews have no fixed format regarding the content of the questions and the assessment of the answers. Conventional structured interviews ask the same questions to the candidates and can rate the answers using the same form. The majority of the questions of unstructured and conventional interviews focus on attitudes and opinions (Janz, Hellervik, & Gilmore, 1986). The behavioral structured interview is a category of interview that poses the following characteristics (Salgado & Moscoso, 2006): (a) The questions are based on a job analysis, using typically the critical incident technique; (b) The job analysis also serves to identifying the main job dimensions that should be assessed with the interview; (c) The same questions are asked to all the candidates; (d) The same procedure is used for all candidates; (e) In many cases, the candidate answers are assessed using behavioral anchoring rating scales (BARS); (f) The interviewer is previously trained in this technique; (g) The decision is made only when all the candidates have been interviewed.

A meta-analysis of the nomological network of structured interviews found that conventional structured interviews appeared to be mainly measuring general cognitive ability and personality variables, that is, they focus on the intrinsic variables of the applicants (Salgado & Moscoso, 2002). With regard to behavioral structured interviews, these authors found that this type of interview mainly assessed job knowledge and job experience. Consequently, this interview type seems to be concentrated on finding out whether the applicant would perform well in the job.

Several meta-analyses have reported the criterion-related validity of employment interviews (e.g., Huffcut & Arthur, 1994; McDaniel et al., 1994; Salgado, Gorriti, & Moscoso, 2007; Wiesner & Cronshaw, 1988). A meta-analysis of behavioral structured interviews found an operational validity of .62 (Salgado & Moscoso, 2006). In comparison, conventional structured interviews showed an operational validity of .35, and the operational validity of the unstructured interviews was .20 (Huffcut, Roth, & McDaniel, 1996).

Work Sample Tests

Work sample tests can be defined as hands-on simulations of part or all of the job content (Schmidt & Hunter, 1998). Work samples have been used extensively for selecting skilled workers, but they have the limitation that they can only be used with candidates who

already know the job. In other words, candidates do not need to be trained as they have experience on the job.

The largest meta-analysis ever carried out on the criterion-related validity of work sample tests for predicting job performance found operational validity was .33 (Roth, Bobko, & McFarland, 2005). Roth and colleagues (2005) also examined the correlation between general cognitive ability and work sample tests and found a correlation of .38, which agrees with the correlation reported in a previous meta-analysis by Schmidt, Hunter, and Outerbridge (1986).

Job Knowledge Test and Situational Judgment Test

As the term indicates, job knowledge tests are procedures for examining the extent to which the candidate possesses the knowledge required for a particular job. This category of tests can include at least two types of procedures: job knowledge tests and situational judgment tests. Like the work sample tests, job knowledge tests can be used only for experienced candidates (Schmidt & Hunter, 1998).

With regard to the operational validity of job knowledge tests, Hunter and Hunter (1984) reported a coefficient of .48 for predicting overall job performance. For situational judgment tests, McDaniel and colleagues (2001) reported an initial estimate of .34 for predicting job performance; and, more recently, in a second and more comprehensive meta-analysis McDaniel and his colleagues (2007) reported an operational validity of .26.

With regard to the correlation between job knowledge tests and GCA, Schmidt, Hunter, and Outerbridge (1986) found a correlation of .48. In the case of the situational judgment test, McDaniel et al. (2007) reported a correlation of .32 with GCA.

Assessment Centers

The assessment center method is a kind of job simulation that consists of a set of different exercises aimed at assessing several job dimensions (e.g., problem solving, interpersonal behavior, influence and persuasion, and so on). Another important characteristic of the assessment center method is that different raters assess the candidates. The assessment center can also include some traditional procedures such as cognitive ability tests, personality inventories, and interviews, together with less traditional procedures such as role-playing exercises, group discussion exercises, and in-basket tests. This last procedure is probably the most frequent exercise of an assessment center. It consists in presenting applicants with a set of memos, letters, telephone messages, and so on, similar to those they would have to deal with in the actual job. The individuals are asked to organize all this information, as they would be in the real job situation.

Several meta-analyses have been conducted to find the operational validity of overall assessment ratings as well the operational validity of the ratings of the dimensions. The seminal meta-analysis conducted by Gaugler et al. (1987) found an operational validity of .36 for predicting job performance when an overall assessment rating (OAR) was used. Twenty years later, Hermelin, Lievens, and Robertson (2007) found an operational validity of .28. Recently, the operational validity of most of the standard exercises of assessment centers, including oral presentations, in-basket tests, case analysis, leaderless group discussions, and role play was found to range from .18 to .26 (Hoffman et al., 2015). Based on these operational validities and in the intercorrelations among the exercises, the best estimate of the operational validity of the OAR seems to be the score reported by Gaugler et al. (1987).

Biodata

The biodata form consists of biographical data questions about the job and life experiences of each candidate. These questions have been chosen because of their correlation with job performance. Therefore, biodata are criterion-oriented procedures that are empirically derived. In this sense, the construction of a biodata form is similar, for instance, to the method used for the development of the main scales of the MMPI (e.g., hysteria; psychopathy). Biodata forms can include questions such as early experiences in the candidate's first job, in high school, in college, in hobbies, and other pursuits; but due to antidiscrimination legislation, they exclude questions about race, age, marital status, and other forbidden issues in many countries (Schmidt & Hunter, 1998).

A meta-analysis carried out by Rothstein and her colleagues (1990) showed an operational validity of .35 for predicting overall job performance and that the correlation with GCA is moderately large, around .50. This last correlation suggests that biodata indirectly reflect GCA, similarly as conventional structured interviews do.

Reference Check

This assessment method is used at the end of the selection process. Typically, it involves collecting information on a candidate from previous employers. The literature reviews suggest that reference checks are used similarly for high and low complexity jobs, and that there are no significant differences related to the size of the company (Chamorro-Premuzic & Furnham, 2010; Lado, 2012). In the practice of personnel selection, both reference check content and structure show a remarkable variety (Chamorro-Premuzic & Furnham, 2010).

With regard to the operational validity of reference checks, Hunter and Hunter (1984) found a coefficient of .26 for predicting overall job performance. Recently, the meta-

analysis of Lado (2012) found reference checks correlated .25 with general cognitive ability and .17 with job experience.

Applicant Perceptions and Reactions to Selection Procedures

Research conducted since 1990 suggests that candidates have preferences regarding the procedures used for making personnel decisions, and that such preferences can have important consequences for organizational practices of personnel selection (Viswesvaran & Ones, 2004). This research stems from two parallel lines. A first research line based on the selection fairness model of Gilliland (1993; Steiner & Gilliland, 1996). This model distinguishes between procedural justice and distributive justice. Procedural justice refers to the fairness of the personnel selection processes. Distributive justice refers to the fairness of the selection decisions. Related to Gilliland's fairness selection model is Schuler's (1993) social validity perspective that consists of four different aspects related to applicant perceptions of the selection process. These aspects are (a) Informativeness, defined as the degree of information provided to the applicant and perceived as useful; (b) Participation, that is, the degree to which applicants perceive they have a chance to participate and present themselves properly; (c) Transparency, that is, the extent to which the procedures used are transparent; and (d) Feedback, defined as the availability and extent of feedback provided by the organization to the applicants, independently of their success in the selection process.

A meta-analysis carried out by Anderson, Salgado, and Hülshager (2010) examined applicant perceptions and reactions using studies conducted in 17 countries spread worldwide through Europe, North America, Asia, and Africa. With small exceptions, interviews, work sample tests, and resumes were the procedures perceived most favorably. Cognitive tests, personality inventories, and references were also perceived quite favorably. Finally, personal contacts and graphology were perceived unfavorably. Anderson and colleagues (2010) also examined the relation between applicant reactions and the operational validity of the selection procedures. They found large correlations (over .60) between the operational validity of the procedures and the perceptions of favorability, scientific evidence, face validity, and opportunity to perform.

Multiple Prediction of Job Performance Based on the Most Valid Procedures

Based on the validity of the different selection procedures and their interrelationships, the largest correlation can be estimated by combining a set of instruments. In the present case, the validity of selection processes consisting of two or three procedures for predicting several performance criteria was estimated, including overall, one task, and contextual performance, and overall interpersonal and organizational counterproductive work behaviors.

In the case of overall job performance and task performance, as general cognitive ability was the reflective predictor with the largest validity, it was the variable combined with a second predictor or with two additional predictors. In the case of contextual performance and counterproductive work behaviors, conscientiousness was the initial predictor to be supplemented with a second or a third predictor. The results of the two-variable prediction appear in Table 3, while those corresponding to the combinations of three predictors can be seen in Table 4.

Table 3. Best combinations of two procedures for predicting several occupational criteria

Criterion	Predictor Combination	R	R Square
Overall—Job Performance	GCA + BSI	.77	.60
Task—Performance	GCA + C	.68	.46
Contextual Performance	C + GCA	.41	.17
Overall—Counterproductive Work Behavior	C + ES	.52	.27
Interpersonal—Counterproductive Work Behavior	A + ES	.50	.25
Organizational—Counterproductive Work Behavior	C + A	.39	.16

Notes: GCA= general cognitive ability; BSI= behavioral structured interview; C= conscientiousness; EX= extroversion; A= agreeableness; ES= emotional stability.

With reference to overall job performance and task performance criteria, the best combination of two predictors was achieved using a GCA test supplemented with a behavioral structured interview (R=.77). The next best combination was a GCA test supplemented with a measure of the personality factor of conscientiousness (R=.74) or integrity test (R=.74). The third best option was the combination of GCA with a measure of job experience (R=.67). From here on, the contribution of the potential supplement predictors was relatively scant. For example, if a test of a specific cognitive ability (e.g., numerical reasoning) supplemented the GCA test, the second test increased GCA validity only slightly by .02. In the case of task performance, the results were similar.

For predicting contextual performance, the best combination of two predictors was a conscientiousness measure supplemented with a GCA test (R=.41). For the criterion of overall counterproductive work behaviors (OV-CWB), the best option was combining a measure of conscientiousness with a measure of emotional stability (R=.52). For

interpersonal counterproductive behavior (I-CWB), the best combination was a measure of agreeableness supplemented with a measure of emotional stability ($R=.50$). Finally, for the criterion of organizational counterproductive work behavior (O-CWB), the best combination was conscientiousness supplemented by agreeableness ($R=.39$).

Table 4. Best combinations of three procedures for predicting several occupational criteria

Criterion	Predictor Combination	R	R Square
Overall—Job Performance	GCA + BSI + C	.84	.71
Contextual Performance	C + GCA + EX	.47	.22
Overall—Counterproductive Work Behavior	C + A + ES	.45	.20
Interpersonal—Counterproductive Work Behavior	A + ES + C	.52	.27
Organizational—Counterproductive Work Behavior	C + A + ES	.40	.16

Notes: GCA= general cognitive ability; BSI= behavioral structured interview; C= conscientiousness; EX= extroversion; A= agreeableness; ES= emotional stability.

As shown in Table 4, there were two optimum combinations offering similar results when a combination of three procedures was used for predicting overall job performance. The best combination consists of a GCA test supplemented with a behavioral structured interview plus a conscientiousness inventory ($R=.84$). The second best combination was a GCA test supplemented with a behavioral interview and a job knowledge test. These two combinations had very good predictive outcomes. The choice of using one of the combinations or the other could be based on non-psychometric criteria, for instance, the costs of the instruments, the number of candidates, time available, and so on.

With regard to contextual performance, the best combination of three predictors was combining a conscientiousness measure supplemented by a GCA test, and an extroversion measure ($R=.47$). For innovative performance, the best combination was

using a job knowledge test, plus a measure of openness, and a measure of emotional stability. For the criterion of overall CWB, the best predictive option was a personality-based compound of conscientiousness, agreeableness, and emotional stability ($R=.45$). For predicting interpersonal CWB, the optimum combination of three predictors was agreeableness, emotional stability, and conscientiousness ($R=.52$). Finally, for the criterion of organizational CWB, the best combination was conscientiousness, plus agreeableness, and emotional stability ($R=.40$).

Ethnic Group Differences and Biased Prediction

A relevant issue regarding the use of personnel selection procedures is whether they produce ethnic group differences and whether these differences can produce biased predictions. This issue is especially relevant regarding to cognitive tests and personality measures but also it is important for all personnel selection procedures. Schmitt (2014) concluded his review of this issue pointing out that the usual conclusion for at least the last two decades was that the tests did not produce biased predictions for women and members of minority groups. The statistic Cohen's d is the effect size index used to establish whether there are subgroup differences. This effect size is computed by subtracting the minority group mean (e.g., Asian, African American, and Hispanics) from the majority group mean (typically, White) and dividing the difference by the pooled within-group standard deviation of the scores (Schmidt & Hunter, 2014).

In the last 20 years, it has been well documented that cognitive tests showed ethnic subgroup differences. This effect was found particularly in the United States (Berry et al., 2014; Berry & Zhao, 2014; Hough, Oswald, & Ployhart, 2001; Schmitt, Clause, & Pulakos, 1996; but it was also found in other countries such as The Netherlands (De Meijer et al., 2006; teNijenhuis & van der Flier, 1997), South Africa (Kriek & Dowdeswell, 2009), Sweden (Kvist & Gustafsson, 2008), and New Zealand (Guenole, Englert, & Taylor, 2003). In their review of this topic, Bobko and Roth (2013) updated the main findings on the Black-White subgroup differences. According to Bobko and Roth (2013), general cognitive ability tests show $d = .72$ for moderate complexity jobs and $d = .86$ for low complexity jobs. In the case of work sample tests, Bobko and Roth suggested an average $d = .73$. For situational judgment tests, these researchers suggested a weighted average $d = .38$. For biodata, the average d is $.39$ and for assessment centers, d is $.56$. Personality measures presented the lowest d values, with $.04$ for integrity tests and $-.09$ for conscientiousness. Finally, Bobko and Roth

suggested that the Black-White differences range from .31 to .46 for structured interviews.

In the context of the ethnic group differences and biased prediction, it is important to distinguish between differential validity and differential prediction. On one hand, differential validity focuses on subgroup differences in the correlation between a selection procedure and an organizational outcome (e.g., job performance, productivity, salaries, satisfaction, and so on) as evidence of subgroup differences in procedure-outcome relationships. On the other hand, differential prediction focuses on subgroup differences in procedure-criterion unstandardized regression equations as evidence regarding to subgroup differences in procedure-criterion relationships. Recently, several articles reviewed the issue of differential validity and differential prediction (Berry et al., 2014; Berry & Zhao, 2014; Mattern & Patterson, 2013). After controlling for range restriction, Berry et al. (2014) found evidence of a small degree of differential validity in a cognitive test battery. More specifically, Berry et al. (2014) found that the average validity was smaller for Hispanics and African Americans than for Whites and Asians. With regard to differential prediction, empirical research carried out by Berry and Zhao (2014) and Mattern and Patterson (2013) agreed that cognitive ability tests overpredicted African American job performance. In other words, these researchers concluded that cognitive ability tests scores are not predictively biased against African American candidates in the employment setting, which is consistent with the conclusions of Schmitt (2014) mentioned above.

General Conclusion

In recent years, substantial progress in research and practice on personnel selection has been made around the world and many of the limitations that previously affected the field have been overcome. Currently, practitioners involved in personnel selection have a large number of valid assessment procedures and have access to a great deal of research that enables them to use the most appropriate set of instruments for their specific needs. Thus, the job of the practitioners has been strongly endorsed and their role in organizations is increasingly acknowledged and valued.

This article summarizes the operational validity of the 19 most common selection procedures used in current practice. The operational validity of each procedure was determined and the best combinations of pairs or triads of procedures were established. The best combinations were derived on the basis of the respective operational multiple correlation for predicting job performance criteria. Current state-of-the-art in personnel

selection is capable of predicting these criteria and explaining over 60% of job performance variance based on individual differences. Future rises in the explained variance will be probably based on the development of new assessment technologies and on the development of new theoretical approaches for occupational situations.

Further Reading

Anderson, N., Ones, D. S., Sinangil, H. K., & Viswesvaran, C. (Eds.). (2001). *Handbook of industrial, work, and organizational psychology*. London: SAGE.

Evers, A., Anderson, N., & Voskuijl, O. (Eds.). (2005). *Handbook of personnel selection*. Oxford: Blackwell.

Farr, J. L., & Tippins, N. (Eds.). (2010). *Handbook of employee selection*. New York: Routledge.

Le, H., & Schmidt, F. L. (2006). Correcting for indirect range restriction in meta-analysis: Testing a new analytic procedure. *Psychological Methods, 11*(4), 416–438.

Morgeson, F. P., Campion, M. A., Dipboye, R. L., Hollenbeck, J. R., Murphy, K., & Schmitt, N. (2007). Reconsidering the use of personality tests in personnel contexts. *Personnel Psychology, 60*(3), 683–729.

Outz, J. L. (Ed.). (2010). *Adverse impact. Implications for organizational staffing and high stakes selection*. New York: Routledge.

Salgado, J. F. (2003). Predicting job performance using FFM and non-FFM personality measures. *Journal of Occupational and Organizational Psychology, 76*(3), 323–346.

Schmitt, N. (Ed.). (2012). *The Oxford handbook of personnel assessment and selection*. Oxford: Oxford University Press.

Society for Industrial and Organizational Psychology. (2003). *Principles for validation and use of the personnel selection procedures*. Bowling Green, OH: Author.

Tett, R. P., & Christiansen, N. D. (Eds.). (2013). *Handbook of personality at work*. New York: Routledge.

References

- Anderson, N., Born, M., & Cunningham-Snell, N. (2001). Recruitment and selection: Applicant perspectives and outcomes. In N. Anderson, D. S. Ones, H. K. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work, and organizational psychology* (vol. 1, pp. 200-218). London: SAGE.
- Anderson, N., Lievens, F., van Dam, K., & Ryan, A. M. (2004). Future perspectives on employee selection: Key directions for future research and practice. *Applied Psychology: An International Review*, *53*(4), 487-501.
- Anderson, N., Salgado, J. F., & Hülshager, U. R. (2010). Applicant reactions in selection: Comprehensive meta-analysis into reaction generalization versus situational specificity. *International Journal of Selection and Assessment*, *18*(3), 291-304.
- Anderson, N., Salgado, J. F., Schinkel, S., & Cunningham-Snell, N. (2008). Staffing the organization: An introduction to personnel selection and assessment. In N. Chmiel (Ed.), *Introduction to work and organizational psychology* (pp. 257-280). Oxford: Blackwell.
- Barrick, M. R., & Mount, M. K. (1991). The Big Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, *44*(1), 1-26.
- Barrick, M. R., Mount, M. K., & Judge, T. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *International Journal of Selection and Assessment*, *9*(1-2), 9-30.
- Berry, C. M., Clark, M. A., & McClure, T. K. (2011). Racial/ethnic differences in the criterion-related validity of cognitive ability tests: A qualitative and quantitative review. *Journal of Applied Psychology*, *96*(5), 881-906.
- Berry, C. M., Cullen, M. J., & Meyer, J.M. (2014). Racial/ethnic subgroup differences in cognitive ability test range restriction: Implications for differential validity. *Journal of Applied Psychology*, *99*(1), 21-37.
- Berry, C. M., Ones, D. S., & Sackett, P. R. (2007). Interpersonal deviance, organizational deviance, and their common correlates: A review and meta-analysis. *Journal of Applied Psychology*, *92*(2), 361-364.
- Berry, C. M., & Zhao, P. (2014). Addressing criticism of existing predictive bias research: Cognitive ability test scores still overpredict African Americans' job performance. *Journal of Applied Psychology*, *96*(5), 881-906.

Bobko, P., & Roth, P. L. (2013). Reviewing, categorizing, and analyzing the literature on blank -white mean differences for predictors of job performance: verifying some perceptions and updating/correcting others. *Personnel Psychology*, *66*(1), 91-126.

Borman, W. C., Bryant, R. H., & Dorio, J. (2010). The measurement of task performance as criteria in selection research. In J. L. Farr & N. Tippins (Eds.), *Handbook of employee selection* (pp. 439-462). New York: Routledge.

Borman, W. C., & Motowidlo, S. J. (1997). Task performance and contextual performance. *Human Performance*, *10*(2), 99-109.

Borman, W. C., Penner, L. A., Allent, T. D., & Motowidlo, S. (2001). Personality predictors of citizenship performance. *International Journal of Selection and Assessment*, *9*(1-2), 52-69.

Campbell, J. P., Gasser, M. B., & Oswald, F. L. (1996). The substantive nature of job performance variability. In K. R. Murphy (Ed.), *Individual differences and behavior in organizations*. San Francisco: Jossey-Bass.

Chamorro-Premuzic, T., & Furnham, A. (2010). *The psychology of personnel selection*. Cambridge, U.K.: Cambridge University Press.

Conway, J. (1996). Analysis and design of multitrait-multirater performance appraisal studies. *Journal of Management*, *22*(1), 139-162.

De Meijer, L. A. L., Born, M. P., Terlouw, G., & van der Molen, H. T. (2006). Applicant and method factors related to ethnic score differences in personnel selection: A study at the Dutch police. *Human Performance*, *19*, 219-251.

Dorsey, D. W., Cortina, J. M., & Luchman, J. (2010). Adaptive and citizenship-related behaviors at work. In J. L. Farr & N. Tippins (Eds.), *Handbook of employee selection* (pp. 463-487). New York: Routledge.

Edwards, J. R., & Bagozzi, R. P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological Methods*, *5*(2), 155-174.

Fleishman, E. A., & Reilly, M. E. (1992). *Handbook of human abilities: Definitions, measurements, and job and task requirements*. Palo Alto, CA: Consulting Psychologists Press.

García-Izquierdo, A. L., Díaz-Vilela, L., & Moscoso, S. (2015). Work analysis for personnel selection. In I. Nikolaou & J. K. Ostrom (Eds.), *Employee recruitment, selection, and assessment*. East Sussex, U.K.: Psychology Press.

Gaugler, B. B., Rosenthal, D. B., Thornton, G. C., & Bentson, C. (1987). Meta-analysis of assessment center validity. *Journal of Applied Psychology, 72*(3), 493-511.

Gilliland, S. W. (1993). The perceived fairness of selection systems: An organizational justice perspective. *Academy of Management Review, 18*(4), 694-734.

Ghiselli, E. E. (1966). *The validity of occupational aptitude tests*. New York: Wiley.

Gonzalez-Mule, E., Mount, M. K., & Oh, I-S. (2014). A meta-analysis of the relationship between general mental ability and nontask performance. *Journal of Applied Psychology, 99*(6), 1222-1243.

Guenole, N., Englert, P., & Taylor, P. J. (2003). Ethnic group differences in cognitive ability test scores within a New Zealand applicant sample. *New Zealand Journal of Psychology, 32*(1), 49-54.

Guion, R. M. (1998). *Assessment, measurement, and prediction for personnel decisions*. Mahwah, NJ: Erlbaum.

Guion, R. M., & Gottier, R. F. (1965). Validity of personality measures in personnel selection. *Personnel Psychology, 18*(1), 135-164.

Hermelin, E., Lievens, F., & Robertson, I. T. (2007). The validity of assessment centres for the prediction of supervisory performance ratings: A meta-analysis. *International Journal of Selection and Assessment, 15*(4), 405-411.

Hoffman, B. J., & Dilchert, S. (2012). A review of citizenship and counterproductive behaviors. In N. Schmitt (Ed.), *Personnel assessment and selection*. (pp 543-569). New York: Oxford University Press.

Hoffman, B. J., Kennedy, C. L., Lance, C. E., LoPilato, A. C., & Monahan, E. (2015). A review of the content, criterion-related, and construct-related validity of assessment center exercises. *Journal of Applied Psychology, 100*(4), 1143-1168.

Hough, L. M. (1992). The "Big Five" personality variables-construct confusion: Description versus prediction. *Human Performance, 5*(1-2), 139-155.

Hough, L.M., & Ones, D.S. (2001). The structure, measurement, validity, and use of personality variables in industrial, work and organizational psychology. In N. Anderson, D. S. Ones, H. K. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work, and organizational psychology. Vol. 1: Personnel psychology* (pp. 233-277). London: SAGE.

Hough, L. M., Oswald, F. L., & Ployhart, R. E. (2001). Determinants, detection, and amelioration of adverse impact in personnel selection procedures: Issues, evidence, and lesson learned. *International Journal of Selection and Assessment*, 9(1-2), 152-194.

Huffcut, A. I., & Arthur, W. Jr. (1994). Hunter, and Hunter (1984) revisited: Interview validity for entry-level jobs. *Journal of Applied Psychology*, 79(2), 184-190.

Huffcut, A. I., Roth, P. L., & McDaniel, M. (1996). A meta-analytic investigation of cognitive ability in employment interview evaluations: Moderating characteristics and implications for incremental validity. *Journal of Applied Psychology*, 81(5), 459-473.

Hunter, J. E., & Hunter, R. F. (1984). Validity and utility of alternative predictors of job performance. *Psychological Bulletin*, 96(1), 72-98.

Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis: Correcting error and bias in research findings* (2d ed.). Newbury Park, CA: SAGE.

Hunter, J. E., Schmidt, F. L., & Le, H. (2006). Implications of direct and indirect range restriction for meta-analysis methods and findings. *Journal of Applied Psychology*, 91(3), 594-612.

Hurtz, G. M., & Donovan, J. J. (2000). Personality and job performance: The Big Five revisited. *Journal of Applied Psychology*, 85(6), 869-879.

Janz, T., Hellervik, L., & Gilmore, D. C. (1986). *Behavior description interviewing: New, accurate, cost effective*. Newton, MA: Allyn and Bacon.

Judge, T. A., Rodell, J. B., Klinger, E. R., Simon, L. S., & Crawford, E. R. (2013). Hierarchical representations of the five-factor model of personality in predicting job performance: Integrating three organizing frameworks with two theoretical perspectives. *Journal of Applied Psychology*, 98(6), 875-925.

Kreik, H., & Dowdeswell, K. (2009). *Adverse impact and validity evidence in South Africa: 12 years of data trends*. Unpublished manuscript, SHL South Africa.

Kvist, V., & Gustafsson, J. E. (2008). The relation between fluid intelligence and the general as a function of cultural background: A test of Cattell's Investment theory. *Intelligence*, 36(4), 422-436.

Lado, M. (2012). Reference checks, general mental ability, and experience: A study of construct validity. *Revista de Psicología del Trabajo y de las Organizaciones*, 28(2), 119-131.

Lang, J. W. B., Kersting, M., Hülshager, U. R., & Lang, J. (2010). General mental ability, narrower cognitive abilities, and job performance: The perspective of the nested-factors model of cognitive abilities. *Personnel Psychology, 63*(3), 595–640.

Mattern, K. D., & Patterson, B. F. (2013). Test of slope and intercept bias in college admissions: A response to Aguinis, Culpepper, and Pierce (2010). *Journal of Applied Psychology, 98*(1), 134–147.

McDaniel, M. A., Hartman, N. S., Whetzel, D. L., & Grubb, W. (2007). Situational judgment tests, response instructions, and validity: A meta-analysis. *Personnel Psychology, 60*(1), 63–91.

McDaniel, M. A., Morgeson, F. P., Finnegan, E. B., Campion, M. A., & Braverman, E. P. (2001). Use of situational judgment tests to predict job performance: A clarification of the literature. *Journal of Applied Psychology, 86*(4), 730–740.

McDaniel, M. A., Schmidt, F. L., & Hunter, J. E. (1988). A meta-analysis of the validity of methods for rating training and experience in personnel selection. *Personnel Psychology, 41*(2), 283–309.

McDaniel, M. A., Whetzel, D. L., Schmidt, F. L., & Maurer, S. (1994). The validity of employment interviews: A comprehensive review and meta-analysis. *Journal of Applied Psychology, 79*(4), 599–616.

Moscoso, S. (2000). Selection interview: A review of validity evidence, adverse impact and applicant reactions. *International Journal of Selection and Assessment, 8*(4), 356–363.

Ones, D. S., & Viswesvaran, C. (2001). Integrity test and other criterion-focused occupational personality scales (COPS) used in personnel selection. *International Journal of Selection and Assessment, 9*(1-2), 31–39.

Ones, D. S., Viswesvaran, C., & Schmidt, F. L. (1993). Comprehensive meta-analysis of integrity tests. *Journal of Applied Psychology, 78*(4), 679–703.

Pearlman, K., & Sanchez, J. I. (2010). Work analysis. In J. L. Farr & N. Tippins (Eds.), *Handbook of employee selection* (pp. 73–98). New York: Routledge.

Roth, P. L., Bobko, P., & McFarland, L. A. (2005). A meta-analysis of work sample test validity: Updating and integrating some classical literature. *Personnel Psychology, 58*(4), 1009–1037.

- Rothstein, H. R., Schmidt, F. L., Erwin, F. W., Owens, W. A., & Sparks, C. P. (1990). Biographical data in employment selection: Can validities be made generalizable? *Journal of Applied Psychology, 75*(2), 175-184.
- Rotundo, M., & Spector, P. E. (2010). Counterproductive work behavior and withdrawal. In J. L. Farr & N. Tippins (Eds.), *Handbook of employee selection* (pp. 489-511). New York: Routledge.
- Sackett, P. R., & DeVore, C. J. (2001). Counterproductive behaviors at work. In N. Anderson, D. S. Ones, H. K. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work and organizational psychology: Vol 1.* (pp. 145-164) London: Sage.
- Salgado, J. F. (2002). The Big Five personality dimensions and counterproductive behaviors. *International Journal of selection and Assessment, 10*(1-2), 117-125.
- Salgado, J. F. (2003). Predicting job performance using FFM and non-FFM personality measures. *Journal of Occupational and Organizational Psychology, 76*(3), 323-346.
- Salgado J. F. (2015). Estimating coefficients of equivalence and stability for job performance ratings: The importance of controlling for transient error on criterion measurement. *International Journal of Selection and Assessment, 23*(1), 37-44.
- Salgado, J. F. (in press). Using ability tests in selection. In H. Goldstein, E. Pulakos, J. Passmore, & C. Semedo (Eds.), *Handbook of the psychology of recruitment, selection, and retention*. New York: Wiley/Blackwell.
- Salgado, J. F., & Anderson, N. (2003). Validity generalization of GMA tests across countries in the European community. *European Journal of Work and Organizational Psychology, 12*(1), 1-17.
- Salgado, J. F., Anderson, N., & Hülshager, U. R. (2010). Psychotechnics and the forgotten history of modern scientific employee selection. In J. L. Farr & N. Tippins (Eds.), *Handbook of employee selection* (pp. 921-942). New York: Routledge.
- Salgado, J. F., Anderson, N., Moscoso, S., Bertua, C., & De Fruyt, F. (2003a). International validity generalization of GMA and cognitive abilities: A European community meta-analysis. *Personnel Psychology, 56*(3), 573-605.
- Salgado, J. F., Anderson, N., Moscoso, S., Bertua, C., De Fruyt, F., & Rolland, J. P. (2003b). A meta-analytic study of general mental ability validity for different occupation in the European community. *Journal of Applied Psychology, 88*(6), 1068-1081.

Salgado, J. F., Anderson, N., & Tauriz, G. (2015). The validity of ipsative and quasi-ipsative forced-choice personality inventories for different occupational groups: A comprehensive meta-analysis. *Journal of Occupational and Organizational Psychology*, *88*(4), 797–834.

Salgado, J. F., & De Fruyt, F. (2005). Personality in personnel selection. In A. Evers, N. Anderson, & O. Voskuil (Eds.), *Handbook of personnel selection* (pp. 174–198). London: Blackwell.

Salgado, J. F., Gorriti, M., & Moscoso, S. (2007). The structured behavioural interview and job performance in Spanish public administration: Psychometric properties and fairness reactions. *Psychology in Spain*, *12*, 88–96.

Salgado, J. F., & Moscoso, S. (1996). Meta-analysis of interrater reliability of job performance ratings in validity studies of personnel selection. *Perceptual and Motor Skills*, *83*, 1195–1201.

Salgado, J. F., & Moscoso, S. (2002). Comprehensive meta-analysis of the construct validity of the employment interview. *European Journal of Work and Organizational Psychology*, *11*(3), 299–324.

Salgado, J. F., & Moscoso, S. (2003). Internet-based personality testing: equivalence of measures and assessee's perceptions and reactions. *International Journal of Selection and Assessment*, *11*(1), 194–203.

Salgado, J. F., & Moscoso, S. (2006). Utiliser les entretiens comportementaux structures pour la selection du personnel. In C. Levy-Leboyer, C. Louche, J. P. Rolland, & C. Louche (Eds.), *RH: Les apports de la psychologie du travail* (pp. 195–208). Paris: Les Editions d'Organization.

Salgado, J. F., & Moscoso, S. (2008). Personnel selection in industry and public administration: From the traditional view to the strategic view. *Papeles del Psicólogo*, *29*(1), 16–24.

Salgado, J. F., Moscoso, S., & Anderson, N. (2013). Personality and counterproductive work behavior. In R. P. Tett & N. D. Christiansen (Eds.), *Handbook of personality at work* (pp. 606–632). New York: Routledge.

Salgado, J. F., Moscoso, S., & Anderson, N. (2013). Corrections for criterion reliability in validity generalization: The consistency of Hermes, the utility of Midas. *Revista de Psicología del Trabajo y de las Organizaciones*, *32*(1), 1–7.

Salgado, J. F., Moscoso, S., & Berges, A. (2013). Conscientiousness, its facets, and the prediction of job performance ratings: Evidence against the narrow measures. *International Journal of Selection and Assessment, 27*(1), 74-84.

Salgado, J. F., Moscoso, S., Sanchez, J. I., Alonso, P., Choragwicka, B., & Berges, A. (2015). Validity of the five-factor model and their facets: The impact of performance measure and facet residualization on the bandwidth-fidelity debate. *European Journal of Work and Organizational Psychology, 24*(3), 325-349.

Salgado, J. F., & Tauriz, G. (2014). The Five-Factor Model, forced-choice personality inventories and performance: A comprehensive meta-analysis of academic and occupational validity studies. *European Journal of Work and Organizational Psychology, 23*(1), 3-30.

Salgado, J. F., Viswesvaran, C., & Ones, D.S. (2001). Predictors used for personnel selection: An overview of constructs, method and techniques. In N. Anderson, D. S. Ones, H. K. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work, and organizational psychology. Vol. 1: Personnel psychology* (pp. 165-199). London: Sage.

Sanchez, J. I., & Levine, E. L. (2012). The rise and fall of job analysis and the future of work analysis. *Annual Review of Psychology, 63*(1), 397-425.

Schippman, J. S., Ash, R. A., Battista, M., Carr, L., Eyde, L. D., Hesketh, B., . . . Sanchez, J. I. (2000). The practice of competency modelling. *Personnel Psychology, 53*(3), 703-740.

Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin, 124*(2), 262-274.

Schmidt, F. L., & Hunter, J. E. (2014). *Methods of meta-analysis: Correcting error and bias in research findings* (3d ed.). Newbury Park, CA: SAGE.

Schmidt, F. L., Hunter, J. E., & Ones, D. S. (1992). Personnel selection. *Annual Review of Psychology, 43*(1), 627-670.

Schmidt, F. L., Hunter, J. E., & Outerbridge, A. N. (1986). Impact of job experience and ability on job knowledge, work sample performance, and supervision ratings of job performance. *Journal of Applied Psychology, 71*(3), 432-439.

Schmidt, F. L., Oh, I. S., & Le, H. (2006). Increasing the accuracy of corrections for range restriction: Implications for selection procedure validities and others research results. *Personnel Psychology, 59*(2), 281-395.

Schmitt, N. (2014). Personality and cognitive ability as predictors of effective performance at work. *Annual Review of Organizational Psychology and Organizational Behavior, 1*, 45-65.

Schmitt, N., Clause, C., & Pulakos, E. (1996). Subgroup differences associated with different measures of some common job relevant constructs. In C. L. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (vol. 11, pp. 115-140). Chichester, U.K.: Wiley.

Schmitt, N., Gooding, R. Z., Noe, R. A., & Kirsch, M. (1984). Meta-analysis validity studies published between 1964 and 1982 and the investigation of study characteristics. *Personnel Psychology, 37*(3), 402-422.

Schneider, B. (1987). The people make the place. *Personnel Psychology, 40*(3), 437-453.

Schneider, B., Goldstein, H. W., & Smith, D. B. (1995). The ASA framework: An update. *Personnel Psychology, 48*(4), 747-779.

Schuler, H. (1993). Social validity of selection situations: A concept and some empirical results. In H. Schuler, J. L. Farr, & N. Schmitt (Eds.), *Personnel selection and assessment: Individual and organizational perspectives*. Mahwah, NJ: Erlbaum.

Steiner, D. D., & Guilliland, S.W. (1996). Fairness reactions to personnel selection techniques in France and the United States. *Journal of Applied Psychology, 81*(4), 124-141.

TeNijenhuis, J., & van der Flier, H. (1997). Comparability of GATB scores for immigrants and majority group members: Some Dutch findings. *Journal of Applied Psychology, 82*(5), 675-687.

Tett, R., Rothstein, M. G., & Jackson, D. J. (1991). Personality measures as predictors of job performance: A meta-analytic review. *Personnel Psychology, 44*(4), 703-742.

Van Scotter, J. R., & Motowidlo, S. (1996). Interpersonal facilitation and job dedication as separate facets of contextual performance. *Journal of Applied Psychology, 81*(5), 525-531.

Vinchur, A. J., & Koppess Bryan, L. L. (2012). A history of personnel selection and assessment. In N. Schmitt (Ed.), *The Oxford handbook of personnel assessment and selection* (pp. 9-30). Oxford: Oxford University Press.

Viswesvaran, C., & Ones, D.S. (2004). Importance of perceived personnel selection systems fairness determinants: Relations with demographic, personality, and job characteristics. *International Journal of Selection and Assessment, 12*(1-2), 172-186.

Viswesvaran, C., Ones, D., & Schmidt, F. L. (1996). Comparative analysis of the reliability of job performance ratings. *Journal of Applied Psychology, 81*(4), 557-574.

Viswesvaran, C., Schmidt, F. L., & Ones, D. S. (2005). Is there a general factor in ratings of job performance? A meta-analytic framework for disentangling substantive and error influences. *Journal of Applied Psychology, 90*(1), 108-131.

Wiesner, W. H., & Cronshaw, S. F. (1988). The moderating impact of interview format and degree of structure on interview validity. *Journal of Occupational Psychology, 61*(2), 275-290.

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