Poster

TITLE

Moderating Effects of Tenure on the Predictive Validity of Personality

ABSTRACT

We examine the moderating effects of tenure on the relationship between personality measures and job performance. Results across eight studies (N = 3,386) show that validity coefficients are nearly twice as high for incumbents with a tenure of two or more years compared to those with less than two years.

PRESS PARAGRAPH

In this study, we examine the moderating effects of tenure on the relationship between personality measures and job performance. Specifically, we hypothesized that tenure would moderate predictive validity such that longer tenure would result in stronger relationships between personality results and job performance than would shorter tenure. Meta-analysis results from eight studies containing data from over 3,300 subjects confirmed that, across measures, predictive validity coefficients were approximately twice as high for employees with at least two years' tenure compared to those who had been on the job for less than two years.

The debate concerning the predictive validity of personality measures continues to receive attention in both academic and applied circles. For example, Morgeson, Campion, Dipboye, Hollenbeck, Murphy, and Schmitt (2007a, 2007b) recently raised concerns over what they describe as the "very low" predictive validity of personality assessments, claiming that research findings warrant a reexamination of their use for employee selection. They base their claim on results from meta-analyses examining the relationships between individual personality scales and overall measures of job performance (e.g., Barrick & Mount, 1991; Barrick, Mount, & Judge, 2001; J. Hogan & Holland, 2003; Hurtz & Donovan, 2000; Roberts, Chernyshenko, Start, & Goldberg, 2005). Although a growing body of research demonstrates significant relationships between individual personality scales and specific areas of job performance (J. Hogan & Holland, 2003; Ashton, 1998), much of the debate concerning the use of personality assessments continues to focus on relationships between personality measures and overall job performance.

In contrast, Hough and Oswald (2008) argue for the importance of relationships between personality measures and both work and non-work related outcomes. They cite findings showing significant relationships between personality measures and multiple job outcomes, such as supervisory ratings of overall performance, counterproductive work behaviors, team performance, job satisfaction, and occupational attainment. They also cite research showing significant relationships between personality measures and non-work related outcomes, such as mortality, health behaviors, divorce, and drug use.

Interestingly, both sides of the debate commonly cite the same research to support their claims. For example, Hurtz and Donovan (2000) conducted a meta-analysis

examining relationships between Five-Factor Model (FFM; cf. Digman, 1990; Goldberg, 1992; John, 1990; McCrae & Costa, 1987) personality measures and overall job performance. Although their results were similar to previous meta-analyses often cited in support of using personality measures in selection settings (e.g., Barrick & Mount, 1991; Salgado, 1997, 1998; Tett, Jackson & Rothstein, 1991), they interpreted their results differently. In referring to prior enthusiasm expressed over the use of the FFM dimension Conscientiousness to predict job performance, Hurtz and Donovan concluded that the magnitude of their results "were not as impressive as one would expect." Despite their concerns, other researchers continue to cite Hurtz and Donovan's results in articles supporting the use of personality measures for selection (e.g., Bartram, 2005; Hough and Oswald, 2008).

This continuing debate in personality raises the question: "How can two opposing camps review the same materials and reach such drastically different conclusions?" At the most fundamental level, we believe there is a strong theoretical argument for linking personality to important job outcomes. It seems unreasonable to expect personality to have no impact, or even a very small impact, on job performance. But if this is the case, why are predictive validity coefficients for personality often lower than those found with other selection instruments, such as cognitive ability, assessment centers, and structured interviews?

In this study, we explore one possible explanation for why prior studies have failed to find stronger relationships between personality measures and job performance. Using data from multiple samples representing a range of jobs, organizations, and

industries, we examine the potential moderating effects of tenure on the predictive validity of personality.

The Debate over Personality

Much of the debate concerning the predictive validity of personality measures concerns three issues: (a) comparative predictive validity, (b) adverse impact, and (c) incremental validity. For example, most opponents of using personality measures for employee selection argue that other commonly used selection instruments, such as cognitive ability measures, are more predictive of future job performance (e.g., Morgeson et al., 2007a; 2007b). In contrast, many proponents argue that, despite relatively lower predictive validity, the lack of adverse impact in personality measures warrants their use (e.g., Hough & Oswald, 2008; Ones, Dilchert & Viswesvaran, 2007; Tett & Christensen, 2007).

Despite these disagreements, both groups find common ground when discussing incremental validity, acknowledging that personality assessments provide a potentially valuable contribution to selection systems when used in conjunction with other instruments. Numerous studies have demonstrated that personality measures show incremental validity over other types of selection measures, such as cognitive ability (Avis, Kudish, & Fortunato, 2002; Day & Silverman, 1989; Ones, Viswesvaran, & Schmidt, 1993; Schmidt & Hunter, 1998), biodata inventories (Buttiqieq, 2006; McManus & Kelly, 1999), work skill tests (Neuman & Wright, 1999), and assessment centers (Goffin, Rothstein, & Johnston, 1996). When used in conjunction with these measures, personality instruments can provide an inexpensive and effective means of increasing the overall predictive validity of a selection system.

Predictor-Criterion Alignment

Research has demonstrated that narrow personality facets show incremental validity over broader personality scales in predicting multiple aspects of job performance (Crant, 1995; Dudley, Orvis, Lebiecki & Cortina, 2006; Ones & Viswesvaran, 2001). Central to this issue is a growing discussion of predictor-criterion alignment. Many proponents of personality assessment argue that relationships between personality and conceptually aligned work outcomes demonstrates clear value in applied settings (e.g., J. Hogan & Holland, 2003; Ones, Dilchert, Viswesvaran, & Judge, 2007; Tett & Christensen, 2007). Support for the validity of personality scales that are conceptually aligned with important work related outcomes abounds (e.g., Bartram, 2005; Berry, Ones, & Sackett, 2007; J. Hogan & Holland, 2003; Judge, Bono, Ilies, & Gerhardt, 2002; Tett, Jackson, Rothstein, & Reddon, 1999). In addition, several studies have demonstrated the value of predicting both overall job performance and specific work related outcomes through scales comprised of personality facets from across FFM dimensions, called "compound personality scales" by Ones and colleagues (Hough & Ones, 2001; Hough & Oswald, 2000; Ones et al., 1993; Ones & Viswesvaran, 2001). Critics, however, argue that only relationships with overall job performance are relevant for large-scale personnel selection (Morgeson et al. 2007a, 2007b).

In part, we agree with both views. On the one hand, when the primary goal of personnel selection is the identification of high potential job applicants, selecting individuals based only on one or two important job components could have limited value. On the other hand, ignoring relationships between personality variables and important job components, while failing to capitalize on these relationships in predicting overall job

performance, fails to capture the true predictive validity of personality for personnel selection. Therefore, we argue that when examining the predictive validity of personality measures, it is important to investigate relationships with both conceptually aligned criteria and measures of overall job performance.

Potential Moderators

Most well-known and highly cited meta-analyses examining the relationships between FFM personality scales and job performance have found that job type moderates the relationship between some FFM personality scales and job performance (e.g., Barrick & Mount, 1991; Barrick, Mount, & Judge, 2001; Tett et al., 1991). For example, several studies have found that Extraversion is most predictive of sales and managerial jobs, whereas Agreeableness and Openness to Experience are most predictive in jobs that involve customer service (Hurtz & Donovan, 2000). In addition, research on Holland's (1985) RIASEC taxonomy demonstrates that the predictive validity of personality constructs varies across occupation types (Anderson & Foster, 2006).

In addition, research has found significant interactions between personality measures, indicating that some FFM scales moderate relationships between other FFM scales and job performance. This is true for both overall job performance (Burke & Witt, 2002, 2004; Foster & Streich, 2006; Grant, 1995; Tett & Burnett, 2003) and specific areas of job performance such as sales performance (Warr, Bartram, & Martin, 2005), interpersonal interaction (Viswesvaran, Ones, & Hough, 2001; Mount, Barrick, & Stewart, 1998), and intellectual competence (Chamorro-Premuzic & Furnham, 2005).

One issue that has not received much attention is the potential moderating effects of tenure. Although some have argued that personality is more predictive of job

performance as tenure increases (e.g., R. Hogan, 2007), these arguments have largely been speculative. We found only one empirical study testing this hypothesis. Burrus (2007) hypothesized that relationships between Conscientiousness and job performance would increase over time. A pilot study provided initial support for this hypothesis. Although a follow-up study did not find additional statistically significant support, results indicated that more time would have provided sufficient data to support the hypothesis.

In contrast, several studies have examined the moderating effects of tenure on the predictive validity of ability assessments. For example, a number of studies have found that relationships between ability measures and performance decrease over time (e.g., Henry & Hulin, 1987; Hulin, Henry, & Noon, 1990; Keil, & Cortina, 2001). In fact, this phenomenon is nothing new. Researchers have long expressed concerns over a general decline in validity coefficients between numerous predictors and important outcomes (Ackerman, 1988).

To fill this gap in existing personality research, we sought to examine the potential moderating effects of tenure on the predictive validity of personality measures. Given the lack of research in this area, we conducted an exploratory study without pre-defined hypotheses. Specifically, we examined the effects of tenure on the relationships between personality measures and job performance across multiple measures and samples.

Methods

Predictor Variables

To control for potential differences arising from the use of different personality assessments, we only used studies that included results from the Hogan Personality

Inventory (HPI: R. Hogan & Hogan, 2007) as predictor measures. The HPI contains seven primary scales that align with the FFM, as presented in Figure 1. The HPI was the first measure of personality developed to assess the FFM in a normal population of working adults. The primary scales are scored using 206 true-false items with internal consistency and test-retest reliabilities, respectively, as follows: Adjustment (.89/.86), Ambition (.86/.83), Sociability (.83/.79), Interpersonal Sensitivity (.71/.80), Prudence (.78/.74), Inquisitive (.78/.83), and Learning Approach (.75/.86).

Meta-analysis results demonstrate that four HPI scales consistently relate to performance across jobs (R. Hogan & Hogan, 2007). Those scales include Adjustment (FFM: Emotional Stability), Ambition (FFM: Extraversion), Interpersonal Sensitivity (FFM: Agreeableness), and Prudence (FFM: Conscientiousness). Based on these results, we focused on relationships between these scales and job performance.

Criterion Variables

We examined relationships between HPI scales and two criterion variables: (a) overall job performance, and (b) measures conceptually aligned with each predictor scale. We assessed overall job performance using both single item measures (e.g. "rate this employees overall job performance") and composite measures developed by averaging scores across multiple job performance items.

We also examined relationships between each predictor scale and conceptually aligned criterion variables. For each sample, we identified performance items aligned with HPI Adjustment, Ambition, Interpersonal Sensitivity, and Prudence scales. When more that one item aligned with a predictor scale, we asked independent researchers familiar with the HPI to identify the item most reflect of the scale. Using these

procedures, we aligned performance items with all four predictor scales in five of our eight samples. In two samples, we aligned performance items with three of the four predictors. In the remaining sample, we aligned performance items with two of the four predictors.

Items that aligned with the HPI Adjustment scale included "is steady under pressure" and "stress management." Items that aligned with the Ambition scale included "demonstrates a strong desire to achieve" and "productivity/amount of work." Items that aligned with the Interpersonal Sensitivity scale included "builds partnerships" and "developing relationships." Finally, items aligned with the Prudence scale included "follows rules and regulations" and "work ethic."

Samples

We used the Hogan archive to identify samples. The Hogan archive contains data from over 250 criterion studies conducted over the last 30 years that represent a variety of jobs, organizations, and industries. To be considered for this study, studies had to include: (a) HPI data, (b) supervisory ratings of job performance representing multiple critical components, (c) tenure data, and (d) a sample of at least 150 individuals representing multiple tenure groups, and (e) data from individuals ranging in tenure from zero to two years on the job. We identified eight studies that met these criteria. Studies represented a variety of jobs, organizations, and industries.

Tenure

We examined three levels of tenure: (a) less than one year, (b) at least one year but less than two years, and (c) more than two years. Although we could have selected any number of ranges to examine tenure, we selected these three ranges because they

provided both short-term and long-term representation and were abundant within our available data. Sample size means for each group were 207, 68, and 149 respectively.

Analyses

We conducted a series of meta-analyses to examine relationships between predictor scales and both overall performance and aligned criteria. We used procedures outlined by Hunter and Schmidt (2004), who argue that differences in an assessment's validity across studies reflect statistical artifacts (e.g., sampling deficiency) and measurement problems (e.g., predictor/criterion unreliability, range restriction) rather than characteristics unique to specific jobs or situations. These procedures demonstrate that correlations between performance measures and cognitive ability tests (Schmidt & Hunter, 1977), biographical data inventories (Schmidt & Rothstein, 1994), personality inventories (Barrick & Mount, 1991; Barrick, Mount, & Gupta, 2003; J. Hogan & Holland, 2003; Hough, 1992; Judge, Bono, Ilies, & Gerhardt, 2002; Salgado, 1997, 1998; Tett et al., 1991), assessment center exercises (Arthur, Day, McNelly, & Edens, 2003; Gaugler, Rosenthal, Thornton, & Benson, 1987), and situational judgment tests (McDaniel, Morgeson, Finnegan, Campion, & Braverman, 2001) generalize across jobs and organizations.

We used zero-order product-moment correlations (r) as effect sizes for all studies. As recommended by Hunter and Schmidt (2004), we used a random-effects model, allowing the population parameter to vary from study to study. As a result, this model allows for the possibility that relationships between variables vary across jobs and organizations. This feature contrasts with fixed-effects models, which assume that the relationship between variables is consistent across all studies.

The use of a random effects model allows researchers to present both confidence intervals and credibility intervals. On the one hand, confidence intervals estimate the statistical significance of the relationship between variables across jobs and organizations. If the lower end of a 95% confidence interval does not include zero, there is less than a 5% chance that results are due to chance. On the other hand, credibility intervals estimate the variability of results across studies. If the lower end of a 80% credibility interval does not include zero, more than 90% of the relationship between variables across studies will be in the expected direction (i.e., will have positive correlations). In other words, confidence intervals estimate the *accuracy* of the relationship between variables and credibility intervals estimate the *variability* in results across specific settings.

Although some researchers (e.g., Murphy & De Shon, 2000) argue against the use of rater-based reliability estimates, we followed procedures outlined by Barrick and Mount (1991) and Tett et al. (1991), using the .508 reliability coefficient proposed by Rothstein (1990) as the estimate of the reliability of supervisory ratings of job performance. Job performance measures lack perfect reliability, meaning that supervisory ratings may vary due to factors such as the characteristics of the supervisor and time during which measures are collected. This lack of reliability attenuates correlations between predictors and measures of job performance. The correction for unreliability used in this study estimates the true relationship between scores from the competency-based algorithms and performance along these competencies.

Hunter and Schmidt (2004) point out that meta-analysis results can be biased unless each sample contributes the same number of correlations to the analysis. To

eliminate such bias, we used only one criterion measure per study to represent each competency. Furthermore, we did not correct correlation coefficients to estimate validity at the construct level. Although some (e.g., Mount & Barrick, 1995; Ones, Viswesvaran, & Schmidt, 1993) argue that this artifact can be corrected, we believe it is premature to estimate the validity of perfect constructs when there is no agreement regarding what they are. That is, scales on personality measures that purportedly assess the same construct are nuanced and extend the boundaries of those constructs in directions beyond the central theme.

Results

Table 1 presents meta-analysis results across tenure groups for aligned performance criteria. Table 2 presents results for overall job performance. In all but one instance, parameter estimates were higher for all four scales across both criteria examined for the "2 years and greater" group compared to the other two groups. The exception was for Prudence when examined using aligned criteria, where the observed correlation was higher for the "one year and greater but less than two years" group (r_{obs} = .17) compared to the "two years and greater" group (r_{obs} = .l6). Furthermore, across all four scales, results were nearly twice as high for the "two years and greater" group as for the other two groups combined. This was true for both aligned criteria, which showed a 92% increase in predictive validity, and for overall job performance, which showed a 96% increase in predictive validity.

Discussion

Unlike other common selection instruments, our results show that the predictive validity of personality increases over time. Given the debate over the value of using

personality assessment for selection, our results demonstrate that predictive validity is determined, in part, by tenure. In other words, personality plays a more substantial role in predicting job performance as tenure increase.

Coupled with evidence that the predictive validity of ability measures (e.g., ability, skill, cognitive ability tests) decreases over time, our results indicate that ability plays a central role in predicting performance when the employee is relatively new to the job. Over time, however, these measures become less predictive as employees encounter opportunities to acquire new skills or complete training needed to perform effectively. In contrast, personality measures show the opposite pattern. Specifically, personality plays a less critical role in forecasting performance when employees are relatively new to a job, when the ability to acquire necessary knowledge and skills is critical to success. Once the employee has been in the job for a sufficient period of time, however, personality plays an increasing role in determining job performance.

To further explore the potential impact of these findings, future researcher should attempt to address several limitations with this study. First, it would be worthwhile to replicate these findings using multiple personality instruments and a wider range of samples. Although we limited this study to one personality instrument to control for confounds associated with measure-based differences, it would be useful to examine these relationships with other common personality assessments. Furthermore, although our samples represent a range of jobs, organizations and industries, it would be useful to replicate these results with additional samples.

Research should also examine additional tenure levels. We selected our groups to represent individuals new to their job, those on the job for at least one year, and those on

the job long enough to develop a clear idea of job expectations and establish relationships with supervisors. It would be valuable, however, to examine tenure differences broken down by more specific intervals, particularly within the first group (i.e., by months on the job) and last group (i.e., longer tenure periods) to examine the predictive validity of personality measures.

A third limitation of this research is its cross-sectional nature. Longitudinal data would be helpful to further examine the moderating effects of tenure on personality-job performance relationships. Although these data are difficult to obtain, especially for multiple jobs, we encourage researchers to examine these effects by following the same cohort across time. Along these lines, longitudinal data would allow researchers to investigate the influence of attrition. If personality also influences attrition, researchers must account for potential confounds in determining the moderating effects of tenure on relationships between personality and performance.

Finally, it would be worthwhile to examine these relationships with other commonly used selection instruments. Although similar research has examined these effects using cognitive ability, very little research has examined the potential moderating effects of tenure on predictive validity of other commonly used selection tools, such as interviews, biodata instruments, situational judgment instruments, and assessment centers.

Conclusions

In this study, we show that tenure moderates the predictive validity of personality measures. When validating personality instruments, we encourage researchers to account for tenure, not just as a potential covariate, but as a way to understand the true

relationships between such measures and performance over the length of an individual's employment in a given job/organization. We encourage future research examining this relationship for both personality and other commonly used selection instruments. Such information would provide organizational decision makers with information to help them better align their selection process with organizational objectives.

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Table 1
Meta-Analysis Results for Aligned Constructs

Tenure Group	Scale	k	N	r_{obs}	SD_r	ρ	%VE	80% CV	95% CI
< 1 year	ADJ	6	1,054	.09	.06	.13	100%	.09	.03
	AMB	7	523	.12	.10	.16	100%	.12	.03
	INT	8	1,171	.07	.07	.10	100%	.07	.02
	PRU	7	1,142	.04	.11	.06	52%	-.04	-.01
≥ 1 year but < 2 years	ADJ	6	331	.15	.24	.22	26%	-.08	.05
	AMB	7	449	.04	.14	.05	79%	-.01	-.06
	INT	8	550	.06	.12	.08	100%	.06	-.02
	PRU	7	521	.17	.11	.24	98%	.15	.09
≥ 2 years	ADJ	6	1,135	.24	.06	.34	100%	.24	.18
	AMB	7	1,445	.14	.12	.20	33%	.03	.09
	INT	8	1,648	.17	.08	.24	81%	.14	.12
	PRU	7	1,553	.16	.06	.23	100%	.16	.11

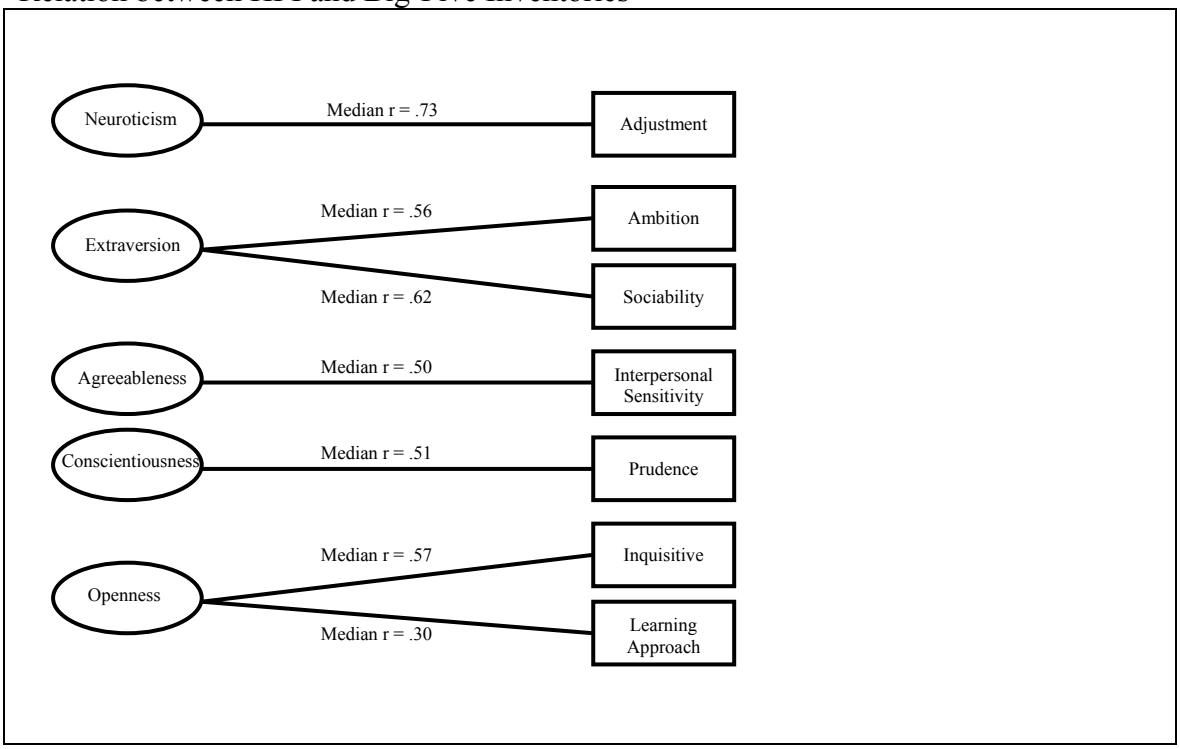
Note. ADJ = Adjustment; AMB = Ambition, INT = Interpersonal Sensitivity; PRU = Prudence; k = Number of correlations; N = Sample size; r_{obs} = Observed mean correlation; SD_r = Sample-weighted standard deviation; ρ = Sample weighted correlation corrected for unreliability in the criteria; %VE = Percent of variance accounted for by sampling error and artifact corrections' 90% CV = lower 10% boundary of 80% Credibility Interval; 95% CI = lower 2.5% boundary of 95% Confidence Interval

Table 2
Meta-Analysis Results for Overall Performance

Tenure Group	Scale	k	N	r_{obs}	SD_r	ρ	%VE	80% CV	95% CI
< 1 year	ADJ	8	1,188	.09	.11	.12	52%	.00	.03
	AMB	8	1,188	.06	.10	.09	71%	.01	.01
	INT	8	1,188	.04	.08	.05	100%	.04	-.02
	PRU	8	1,188	.07	.07	.10	100%	.07	.02
≥ 1 year but < 2 years	ADJ	8	545	.09	.19	.13	37%	-.08	.01
	AMB	8	546	.01	.16	.02	57%	-.10	-.07
	INT	8	546	.05	.16	.07	56%	-.06	-.03
	PRU	8	545	.08	.06	.12	100%	.08	.00
≥ 2 years	ADJ	8	1,653	.14	.10	.19	44%	.05	.09
	AMB	8	1,653	.13	.13	.18	27%	.00	.08
	INT	8	1,653	.08	.05	.11	100%	.08	.03
	PRU	8	1,653	.13	.07	.18	97%	.11	.08

Note. ADJ = Adjustment; AMB = Ambition, INT = Interpersonal Sensitivity; PRU = Prudence; k = Number of correlations; N = Sample size; r_{obs} = Observed mean correlation; SD_r = Sample-weighted standard deviation; ρ = Sample weighted correlation corrected for unreliability in the criteria; %VE = Percent of variance accounted for by sampling error and artifact corrections' 90% CV = lower 10% boundary of 80% Credibility Interval; 95% CI = lower 2.5% boundary of 95% Confidence Interval

Figure 1
Relation between HPI and Big-Five Inventories



Note: Median correlation coefficients summarize HPI relations with the NEO PI-R (Goldberg, 2000), Goldberg's (1992) Big-Five Markers (R. Hogan & J. Hogan, 1995), Personal Characteristics Inventory (Mount & Barrick, 2001), and the Inventario de Personalidad de Cinco Factores (Salgado & Moscoso, 1999). The ranges of correlates are as follows: Adjustment/Emotional Stability/Neuroticism (.66 to .81); Ambition/Extraversion/Surgency (.39 to .60); Sociability/ Extraversion/Surgency (.44 to .64); Interpersonal Sensitivity/Agreeableness (.22 to .61); Prudence/Conscientiousness (.36 to .59); Inquisitive/Openness/Intellect (.33 to .69); Learning Approach/Openness/Intellect (.05 to .35).