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The Validity Of Personality Trait Interactions For The Prediction Of Managerial Job Performance

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Performance

by

Amy M. Taylor

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Table of Contents

List of Tables

List of Figures

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ABSTRACT

Personality variables have been shown to be significant predictors of job
performance (Barrick & Mount, 1991; Tett, Jackson, & Rothstein, 1991). Recent
advances in methodology for analyzing personality-job performance relationships
indicate that interactions among traits may yield incremental validity. Job types in which
performance has been shown to relate to trait interactions include clerical jobs, jobs with
high interpersonal components, and jobs in realistic and conventional contexts, (Witt,
Burke, Barrick, & Mount, 2002; Burke & Witt, 2002; and Burke & Witt, 2004). This
study examined the validity of trait interactions for the prediction of managerial job
performance. Hypotheses included a main effect for Conscientiousness, an interaction
between Conscientiousness and Agreeableness, an interaction between Extraversion and
Neuroticism, and finally, a three-way interaction between Extraversion, Neuroticism, and
Conscientiousness. An archival dataset from Personnel Decisions, International (n=680
managers) containing GPI personality scores and supervisor-rated performance scores
was analyzed to test the hypotheses. Correlations and moderated hierarchical linear
regressions were performed to estimate the relationships of the predictors to the criterion,
and to learn whether examination of trait interactions contributes incremental validity to
the single trait scales.

A main effect for Conscientiousness on managerial job performance was found. No trait interactions explained incremental variance in performance scores. Therefore, Conscientiousness is the recommended personality scale to use for selecting managers. This finding is consistent with previous research on the relation of Conscientiousness to job performance in managers (Barrick & Mount, 1991). Managers from diverse organizations and industries comprised the sample, increasing the generalizability of the results. Directions for future research include the examination of other trait interactions, more specific criteria such as competencies rather than overall managerial job performance, and effects of the hierarchical level of the manager in the organization.

Introduction

Research on the prediction of managerial job performance has explored numerous predictor variables. One popular predictor is the personality of the manager. Although the usefulness of personality testing has received past criticism (Guion & Gottier, 1965), more recent research supports the validity for predicting job performance. Today, these inventories are commonly used in practice. In fact, about 40% of Fortune 500 companies and 100% of the top 100 UK companies use personality inventories as selection tools (Rothstein & Goffin, 2006). The correlation between personality and managerial job performance has been empirically demonstrated through meta-analysis (Barrick & Mount, 1991; Tett, Jackson, & Rothstein, 1991). This study was intended to further examine the predictive validity of personality for managerial performance by examining the extent to which certain traits may impact the predictive ability of other traits. Meta-analytic evidence supports this moderator hypothesis; substantial unexplained variability remains in the estimated population validity coefficients for four of the Big Five traits (Barrick & Mount, 1991). This study attempted to explain a significant portion of this variance through trait interactions. Before presenting the evidence supporting trait interactions, I first present support for personality as a predictor of managerial job performance.

Past behavior is the best predictor of future behavior. Hogan (2005) contends that personality is a summary of behavioral patterns and thus a good source of information on future behavior. An individual's responses on personality tests can inform employers

about how the applicant is likely to perform on the job. Specifically, personality measures based on the Big Five theory reflect the attitudinal, experiential, emotional, interpersonal, and motivational styles of the individual (Truxillo, Bauer, Campion, & Paronto, 2006).

The Big Five model is a commonly used framework for describing personality. Under this typology, personality is reported via scores on five dimensions, or traits: Extraversion, Conscientiousness, Agreeableness, Neuroticism, and Openness to experience. Research drawing on the Big Five framework has led to more positive conclusions regarding the predictive validity of personality than were previously noted. Guion and Gottier's (1965) review concluded that personality was often a poor predictor of job performance and recommended against the use of personality measures for personnel selection for most jobs. Since that time, meta-analyses using the five-factor framework (Barrick & Mount, 1991; Tett, Jackson, & Rothstein, 1991) found that traits are significantly related to work performance.

The usefulness of the Five Factor model lies in the broad trait descriptions that allow related traits to be combined into more inclusive dimensions (i.e. the Big Five). The first dimension, Extraversion, represents a tendency toward sociability, high energy, and optimism. Neuroticism is associated with emotional instability, hostility, and anxiety. Agreeableness indicates a tendency to be cooperative, trusting, and helpful to others. Openness to Experience refers to one's creative, insightful, and free-thinking attributes. Finally, Conscientious individuals are responsible, organized, and self-disciplined. These five dimensions provide a general framework for classifying personality trait predictors that have been the subject of research. Many personality tests report scores at the more specific facet level which can then be aggregated to the five

factor scores (e.g. NEO-PIR; Costa & McCrae, 1992; GPI; Schmit, Kihm, & Robie, 2000). An additional reason to use personality tests is that they do not distinguish between protected classes of applicants as do some other selection tools. Tests of cognitive ability typically favor white applicants, which can result in adverse impact. The reduced risk of facing an EEO lawsuit increases the appeal of personality tests over certain other selection tools.

The relationship between personality and job performance is supported by empirical evidence. Barrick and Mount's (1991) meta-analysis found that Extraversion, Conscientiousness, and Agreeableness were statistically significant predictors of managerial performance ($\hat{\rho}$ =.10-.22; validities were averaged across job proficiency, training proficiency, and personnel data criteria). When only job proficiency scores were examined, Conscientiousness was a significant predictor across all job types ($\hat{\rho}$ =.23), of which approximately 41% of the samples were managers. Bono and Judge's (2004) meta-analysis of the Big Five and transformational leadership found corrected validities of .13-.24 for each of the five dimensions. Significant correlations were found for each trait with the leadership criterion.

However, it is possible that moderators may explain additional variance. For example, Extraversion was the strongest predictor of transformational leader behaviors ($\hat{\rho}$ =.24). It is reasonable that a leader should be gregarious, energetic and assertive- but if that leader is also anxious or disorganized and does not follow through on commitments, he/she may not be able to inspire or rally support from followers. Thus, an extraverted manager who is high on Neuroticism may pass his or her negative moods and emotions onto subordinates, resulting in a poor work environment. Similarly, an

extraverted manager low on Conscientiousness may not carefully monitor subordinate activities or may not accomplish tasks in a timely manner. This type of manager may be seen as "all talk and no action". Therefore, it is not only the result of being extraverted, but the interactive effect of being extraverted, emotionally stable and conscientious that may result in successful leadership. Results of Barrick and Mount's (1991) meta-analysis reveal substantial variability not explained by artifacts in correlations between four of the Big Five traits (Extraversion, Conscientiousness, Openness, and Emotional stability) and job performance among the managerial samples. This suggests the presence of moderators. This study examines a potential moderator- whether the level of one trait impacts the validity of another trait. This hypothesis posits that consideration of interactions or configural scores rather than single trait scores will yield more accurate predictions for success on the job. For example, Hogan, Hogan, and Roberts (1996) caution that it is ill-advised to interpret single scale scores without additional information, providing the following example: "…persons with high scores on measures of service orientation will be tolerant, patient, and friendly, but they may not work very hard," (p. 470). This illustrates the usefulness of examining both Conscientiousness and Service orientation aspects of personality to predict who will be the top performers in customer service jobs. Similarly, workers high on Conscientiousness but low on Service orientation may be seen as inflexible or demanding, and unable to build relationships and loyalty from customers.

Foster and Macan (2006) encouraged the analysis of interactions in personality testing. Single scale scores cannot address the potential enhancement or inhibition effects of one trait on another. Interaction scores allow for these contingent relations with

4

criteria. Trait interactions are based on the premise that the value of a certain trait is dependent upon the presence of another trait for successful job performance.

Conventional approaches to increasing the usefulness of personality tests as predictors focus on resolving measurement issues (e.g. faking) or identifying different personality and performance constructs (Foster & Macan, 2006). Foster and Macan (2006) offer an additional suggestion: the use of alternative statistical analyses. One example of this is personality trait interactions. Recent work with trait interactions has shown promising results for predicting work behaviors.

Previous Work with Trait Interactions

Openness to experience would seem to be a poor predictor of job performance based on bivariate correlations between the trait and job performance scores ($\hat{\rho} = -.03$, Barrick & Mount, 1991). However, Burke and Witt's (2002) work showed that this low correlation may be enhanced by considering the moderating effect of other personality traits. Using a sample of 114 clerical workers, they found that Extraversion and Emotional stability interacted with Openness to predict job performance. A separate regression was run for each moderator. The Openness x moderator (Extraversion or Emotional stability) cross-product term yielded significant incremental validity over the single scale scores and the control variables age, sex and tenure ($\Delta R^2 = .04$ Extraversion, $\Delta R^2 = .03$ Emotional stability; $p < .05$ for both). Results showed that those with low Openness/high Extraversion or low Openness/low Emotional stability received lower performance ratings. The highest performance ratings were attained by workers high on both Openness to experience and Extraversion, and high on both Openness and Emotional stability. They concluded that low Openness was more detrimental to those

who were likely to express their close-mindedness (extraverts) or who were unable to maintain a positive demeanor (emotionally unstable).

Witt, Burke, Barrick, and Mount (2002) found support for the interactive effect of two other Big Five traits, Conscientiousness and Agreeableness. Of seven employee samples included in this study, five consisted of jobs characterized by frequent interpersonal interactions. The Conscientiousness x Agreeableness interaction term added significant incremental validity in each of the five ($\Delta R^2 = .01 - .02$, $p < .05$). The effect sizes found were within the range of moderator effects typical for nonexperimental studies (Champoux and Peters, 1987; Chaplin, 1991). Conscientious individuals who were also high in Agreeableness tended to have higher job performance scores than Conscientious individuals who were low in Agreeableness. They hypothesize that this is because besides being diligent, dependable and achievement-oriented, employees in jobs with a substantial social interaction requirement must also be cooperative and considerate of others in order to be successful. Witt et al. present the example of a manager who is highly conscientious, but also disagreeable. This manager is likely to be seen as "micromanaging, unreasonably demanding, inflexible…" (p. 165).

Burke and Witt (2004) also found an interaction effect of Agreeableness and Conscientiousness for the prediction of employee high maintenance behaviors (HMBs; Grensing-Pophal, 2001). HMBs are behaviors that are annoying or aggravating such as complaining about work, frequently mentioning the desire to quit, and repeatedly causing interpersonal conflicts at work (Burke & Witt, 2004). The interaction of Agreeableness and Conscientiousness accounted for significant incremental validity ($\Delta R^2 = .01$, $p < .05$), beyond the control variables employee sex, education, tenure, satisfaction with

supervisor, and each of the Big Five traits. Results showed that Agreeableness was only predictive of HMBs for those high in Conscientiousness, such that individuals who scored high on both traits had the least frequent HMBs. For employees low in Conscientiousness, Agreeableness was not predictive of HMBs. Here, the validity of Agreeableness for predicting these negative interpersonal behaviors was contingent upon the level of Conscientiousness.

The studies reviewed thus far show support for interactions of personality traits as predictors of work behaviors; however, they do not examine the validity for prediction of managerial job performance. Foster and Hogan (2006) examined managerial performance in relation to personality profiles. Although trait profiles differ from trait interactions, these techniques are related because both use multiple trait scores as predictors. Using the Hogan Personality Inventory and the Hogan Development Survey, three personality profiles were generated and compared for predictive validity. The first profile was a bright side composite that measured managers' standings on the traits of Adjustment, Ambition, Interpersonal sensitivity, and Prudence, for which higher scores indicated more management potential. The second profile focused on the dark side traits of Excitable, Skeptical, Cautious, Bold, Mischievous, and Imaginative, for which lower scores indicated higher management potential. The third profile was a combination of the bright and dark side traits.

For each profile, participants were grouped as either high or low management potential based on their score percentile for each trait scale within the respective profile. The goal of this study was to determine which profile yielded the highest predictive validity against the performance ratings, determined by the largest between-groups

difference score. Data from six studies (N=810) were combined to produce meta-analytic estimates of mean difference scores in managerial performance ratings for those in the high vs. low leadership potential groups. The bright and dark side profiles yielded estimated population difference scores of .33 and .36, respectively, between the high and low management potential groups. The total leadership profile (combination of both bright and dark side traits) yielded an estimated population difference score of .44. Incremental validity of the profiles over single scale scores was not reported. Although interactions were not specifically tested in this study, results indicate that the use of two profile scores (the combination of bright and dark side traits) predicted leadership ratings better than either profile did separately.

Based on the results from the Burke and Witt (2002, 2004) and Witt et al. (2002) studies, Foster and Macan (2006) tested the validity of two pairs of interactions for predicting job performance: Conscientiousness with Agreeableness and Openness to experience with Extraversion. Hogan Archival data were used to compare personality scores from the HPI and job performance ratings. To test the moderation hypotheses, participants were categorized into high, medium, or low Agreeableness groups and high, medium, or low Extraversion groups. Correlations between the moderating variable (Conscientiousness or Openness) were calculated for each of the three groups across all samples, and the estimates were meta-analyzed. Foster and Macan classified participants' jobs according to Holland's (1996) RIASEC model to account for job context. This model is primarily used to categorize job characteristics to assess person-job fit. Jobs can be classified as Realistic, Investigative, Artistic, Social, Enterprising, or Conventional job

types. Only three of the six were represented in this study: Conventional, Enterprising, and Realistic. Separate effect sizes were estimated for each job family.

Foster and Macan found that Agreeableness moderated the relationship between Conscientiousness and job performance in Conventional and Realistic job types. Persons in the high and low Agreeableness groups showed stronger, positive relationships between Conscientiousness and job performance with those least agreeable having the strongest correlation ($\hat{\rho} = .27$). Foster and Macan did not report which group had the highest performance ratings. One possible reason for this form of interaction is that in these less social job contexts, those who are lower in Agreeableness tend to focus on the task and avoid interacting with coworkers; they are then judged solely on their task performance. Of those who are highly agreeable, persons higher in Conscientiousness may engage in and be more effective at citizenship behaviors and thus have higher job performance ratings (Motowidlo, Borman & Schmit, 1997).

Not all research has shown support for the interaction of personality traits. Warr, Bartram, and Martin (2005) examined interactions between Conscientiousness and each of the other four Big Five traits for predicting sales performance. Each interaction term was tested in a separate moderated regression analysis, but none was significant.

Interactions between Personality Traits and other Variables

Personality may interact with other individual differences and contextual variables to predict job performance. George and Zhou (2001) found a significant three-way interaction between Openness to experience, feedback valence, and unclear means for the prediction of creative behaviors at work ($\Delta R^2 = .04$, p< .05). In a sample of 149 employees from a mechanical equipment production company, the most creative

9

behaviors were exhibited by those who were high on Openness, received positive feedback, and had unclear means of how to complete their tasks. A similar interaction between Openness, feedback valence, and unclear ends was also supported ($\Delta R^2 = .03$, p< .05). As expected, individuals high on Openness who received positive feedback had higher creativity ratings when the desired result of their task was ambiguous. Openness score alone (or within two-way interaction terms) was not a significant predictor in any analyses. George and Zhou reason that situations that present unclear expectations for performance, such as tasks with unclear means and unclear ends, provide an environment that is conducive to the creative tendencies of individuals high on Openness to experience.

The same study also found interactions between Conscientiousness and situational factors. A three-way interaction term between Conscientiousness, supervisor close monitoring, and coworker support yielded incremental validity for predicting creativity behaviors. Conscientiousness alone (or within two-way interaction terms) was not a significant predictor in any analyses. Three facets of coworker support were examined in the three-way interaction terms: unhelpful coworkers, inaccurate communication from coworkers, and negative work environment (e.g. coworkers who always find fault with others). All three facets moderated the validity of Conscientiousness and supervisor close monitoring for predicting creativity ($\Delta R^2 = .04-.06$, p< .05). As hypothesized by George and Zhou, the lowest creativity scores were attained by highly conscientious individuals who were closely monitored by their supervisors and had unsupportive coworkers.

Emotional exhaustion is another proposed moderator of the Conscientiousness-job performance relationship. Witt, Andrews, and Carlson (2004) studied customer service

10

representatives' (CSR) call volumes as a measure of job performance. The main effect of Conscientiousness was not significant in the hierarchical moderated multiple regression analysis; however, the emotional exhaustion x Conscientiousness cross-product term explained a significant portion of variance in call volume ($\Delta R^2 = .03$, p< .05). The relationship between emotional exhaustion and call volume was strongest for CSRs high on Conscientiousness. The highest call volume was attained by CSRs with high Conscientiousness and low emotional exhaustion. Individuals low on Conscientiousness attained similar call volumes across levels of emotional exhaustion.

Witt and Ferris (2003) investigated social skill as another potential moderator of the Conscientiousness – job performance relationship. Specifically, they examined an interpersonal effectiveness component of job performance as the performance criterion. They hypothesized that Conscientiousness would have the strongest positive relationship to performance ratings for workers high in social skill. They also posited that performance ratings would be lowest for workers high on Conscientiousness and low in social skill; that is, workers who are highly Conscientious but lack the ability to appropriately read interpersonal situations would be perceived as demanding, inflexible, and otherwise difficult to work with. Hierarchical moderated regression analysis showed that the interaction term added significant incremental validity ($\Delta R^2 = .03$, p< .05). Consistent with their first hypothesis, workers high on both Conscientiousness and social skill had the highest performance ratings. Among workers low on social skill, Conscientiousness related negatively to performance ratings in one study; the relationship was essentially zero in the second study.

Perceptions of organizational politics may also moderate the Conscientiousness - job performance relationship. Organizational politics refer to behaviors that promote self-interest without regard to, and often in opposition to, organizational goals (Mintzberg, 1983 as cited by Hochwarter, Witt, & Kacmar, 2000). Examples include providing more resources to subordinates who blindly follow orders rather than those who question decisions, and sabotaging the work of coworkers who do not facilitate one's advancement in the organization (Hochwarter, Witt, & Kacmar, 2000). Hochwarter, Witt, and Kacmar found evidence for the interaction of perceptions of organizational politics and Conscientiousness. Although employees with high levels of Conscientiousness tended to receive higher performance ratings regardless of perceptions of organizational politics, those low on Conscientiousness had significantly lower performance ratings if they perceived that political behavior was highly prevalent.

These studies indicate that personality traits interact with other traits as well as organizational variables to predict work behaviors. However, I am aware of no existing research on the validity of trait interactions against the criterion of managerial job performance. This study contributes to personality literature by examining these relationships.

Current Study

As mentioned, this study examined specific hypothesized interactions among personality traits for the prediction of managerial job performance. Management is a highly interactive, socially-oriented job that requires a wide range of characteristics such as charisma, confidence, interpersonal skill, and diligence. The absence of one trait may diminish the efficacy of the other traits. The inclusion of trait interaction scores in

12

hierarchical moderated regression analyses is expected to yield incremental validity over the traditional method of examining single scale validities.

Conscientiousness is the best personality predictor of performance across job types (Barrick & Mount, 1991). High Conscientiousness indicates a tendency towards several effective work behaviors such as being diligent, achievement-oriented, and self-disciplined. Managers who are high on this trait are likely to be effective at meeting deadlines, planning and setting goals, and strictly following organizational policies. For these reasons, I hypothesize a main effect of Conscientiousness on performance.

Hypothesis 1: Conscientiousness will be positively related to managerial job performance.

Cultivation of interpersonal relationships is an essential skill for managers. The quality of interactions with subordinates has consequences for subordinate performance, organizational commitment, and job satisfaction (Gerstner & Day, 1997). A manager should be cooperative with subordinates to inspire a sense of collaboration and mutual respect among employees. This suggests that managers should be high on Agreeableness to be effective. However, agreeableness without a strong need for achievement may lead to a manager who is more focused on getting along with and pleasing subordinates than on completing tasks. Conversely, a manager who is high on Conscientiousness, but low on Agreeableness, may be seen as pushy and demanding. As such, Conscientiousness is predicted to interact with agreeableness to predict managerial performance. This hypothesis is consistent with findings from Witt *et al.* (2002) and Burke and Witt (2004).

Hypothesis 2: Conscientiousness and Agreeableness will interact to predict managerial job performance. The relationship between Conscientiousness and

13

performance will be stronger for those high on Agreeableness than those low on Agreeableness. Further, managers high on both traits will have the highest job performance.

Individuals high on Extraversion tend to interact more with others. Individuals who have more contact with others have more opportunity to spread their emotions via contagion effects. A manager who scores high on Extraversion will be more socially interactive and better able to share his or her enthusiasm with subordinates. However, if the manager is high on Neuroticism, he or she may instead spread negative feelings among subordinates that, over time, could result in low job satisfaction and reduced commitment to the manager and organization. This manager would not be able to inspire or motivate subordinates, a key component of effective leadership. For this reason, Extraversion and Neuroticism are predicted to interact to predict managerial performance.

Hypothesis 3: Extraversion and Neuroticism will interact to predict managerial job performance. The relationship between Extraversion and performance will be stronger for those low on Neuroticism than for those high on Neuroticism. Further, managers who are high on Extraversion and low on Neuroticism will have the highest job performance.

A final hypothesis is based on the interactive effects of Extraversion, Neuroticism and Conscientiousness. As stated in Hypothesis 3, managers who are high on Extraversion and low on Neuroticism are predicted to attain the highest job performance. Because these managers are more socially dominant and more likely to foster positive feelings in the workplace, subordinates may be more receptive to the manager's work

14

values and practices. For this reason these managers may be even more effective when they are also high in Conscientiousness. Conscientious managers who can impart effective work habits associated with their diligence, self-discipline, and thoroughness are more likely to meet performance goals than managers who are low on Conscientiousness.

Hypothesis 4: Extraversion, Neuroticism, and Conscientiousness will interact to predict ratings of managerial job performance. Managers who are high on Extraversion, low on Neuroticism, and high on Conscientiousness will have higher job performance than managers who are high on Extraversion and low on Neuroticism and Conscientiousness.

Method

Participants

A dataset from Personnel Decisions International archives provided personality and job performance scores for 680 managers from numerous organizations across 22 industries. The majority of the sample was male (71%). Ethnicities represented were 84% White, 4% African-American, and 4% Hispanic (8% were other or unreported ethnicities). The managers were between 26-60 years of age (M=41, SD=6.5) with a mean organizational tenure of 9.7 years (SD=7.3). Most managers (79%) held a bachelor's degree or higher.

Measures

Personality. This study used the five dimensions of personality as measured by the Global Personality Inventory (GPI; Schmit, Kihm, & Robie, 2000). This test provided scores on thirty-two lower level facets that were aggregated to the five trait scores per Schmit, Kihm, and Robie's designation (2000; see Appendix for subscales comprising each factor). Subject matter experts created the GPI collaboratively across eleven countries and ten languages using a combined emic and etic approach. This development strategy allows for the comparison of scores among applicants of different nationalities. This is an important contribution in light of the growing trend towards multinational personnel recruitment and selection. The GPI was created specifically to aid in the prediction of work outcomes; the work context was either explicitly mentioned or implied in the wording of each item.

Job performance. Supervisor ratings of job performance are the criterion in this study. Supervisors rated incumbent managers on five items that assess how well he or she gets the job done, gets work done on time, accomplishes a great deal, produces high quality work, and is an effective manager overall. Items were rated on a five point scale and were averaged to one overall managerial job performance score. These ratings were collected for research purposes only and had no administrative consequences. This is a strength of the data, as the supervisors were more likely to give accurate ratings in this appraisal context.

Results

Cronbach's alpha for the 5-item job performance measure was estimated at .88,
indicating a sufficient level of internal consistency. Descriptive statistics and correlations
for study variables are presented in Table 1. Conscientiousness was significantly
correlated with managerial job performance ($r = .14$, $p< .01$), fully supporting Hypothesis
1. To test Hypotheses 2-4, correlations, and subsequently, moderated hierarchical linear
regressions were conducted. The interaction term, Agreeableness x Conscientiousness,
was significantly correlated with job performance. To determine whether inclusion of this
interaction term explained variance in performance ratings above that of the single trait
scores, a hierarchical regression was conducted. First, the job performance ratings were
regressed on the scale scores for Agreeableness and Conscientiousness, and then the
interaction term was entered into the regression to determine the change in R^2 between
the two models. Regression results are presented in Table 2. ΔR^2 was not statistically
significant ($\Delta R^2 = .003$; n.s.). Thus, Hypothesis 2 was not supported.

To identify which managers had the highest performance ratings, managers were
classified as low or high on Conscientiousness and Agreeableness based on whether they
were below the mean score (low) or equal to or above the mean score (high) on each trait.
Mean performance ratings for each group are displayed in Table 3 and represented
graphically in Figure 1. ANOVA with Fisher LSD post-hoc tests revealed that the high
Conscientiousness, low Agreeableness group was significantly higher on the criterion
than the two groups with low Conscientiousness scores ($F (3, 676) = 3.49$, $p< .05$). The

18

Table 1

Correlations of Personality Traits with Managerial Performance Ratings

Variable	M	SD	1	2	3	4	5	6	7
1. Job performance	4.06	.57	.88[a]						
2. C	23.29	3.02	.14**	--					
3. A	34.51	3.66	-.02	.45**	--				
4. E	58.12	7.04	.03	.33**	.43**	--			
5. N	15.14	3.34	.04	-.36**	-.50**	-.56**	--		
6. CxA	808.73	165.81	.08*	.88**	.82**	.45**	-.50**	--	
7. ExN	866.98	163.80	.07	-.24**	-.33**	-.03	.83**	-.34**	--
8. ExNxC	20075.31	4124.84	.15**	.40**	-.05	.16**	.56**	.22**	.79**

Note: n=680

[a]Internal consistency (alpha)

*p< .05; **p< .01

high Conscientiousness, high Agreeableness group scored higher than the two low Conscientiousness groups, but the difference did not reach statistical significance. The two high Conscientiousness groups (low and high Agreeableness) did not differ significantly on performance ratings, indicating that Conscientiousness, and not the interaction with Agreeableness, was the driver of higher job performance.

The cross-product term Extraversion x Neuroticism was not significantly correlated with performance ratings, so no further regression analysis was conducted. Hypothesis 3 was not supported.

The Extraversion x Neuroticism x Conscientiousness term was significantly correlated with job performance ratings, ($r = .15$, $p < .01$). I then tested a hierarchical regression in which the single trait scores were entered in step 1, the two-way interaction terms were entered in step 2, and the three-way interaction term was entered in step 3. See Table 4 for regression results. The interaction of Extraversion by Neuroticism by Conscientiousness did not explain significant incremental variance in performance ratings. Thus, Hypothesis 4 was also not supported.

Extraversion, Neuroticism, and Conscientiousness scores were dichotomized at the mean, and participants placed into one of eight groups depending on whether they were high or low on each variable. ANOVA showed that the groups did not differ significantly on performance ratings, ($F_{(7, 162)} = 1.62$, *n.s*).

Exploratory Analyses

To investigate potential differences in validities among industries, participants were grouped into one of five industry categories: natural resources; construction and manufacturing; trade, transportation, and utilities; financial, business, and professional

Table 2

Hierarchical Regression of Performance Ratings on CxA

Variable	β Step 1	β Step 2
Step 1:		
Conscientiousness	.18**	-.24
Agreeableness	-.10*	-.46
Step 2:		
C x A		.67
R^2	.027**	.030**
ΔR^2	.027**	.003

*p< .05, **p< .01

Table 3

Mean Managerial Performance Ratings by Group

Group	n	mean	sd	std error
Low C, Low A	234	4.00	.58	.04
Low C, High A	109	3.97	.55	.05
High C, Low A	121	4.17	.55	.05
High C, High A	216	4.10	.57	.04
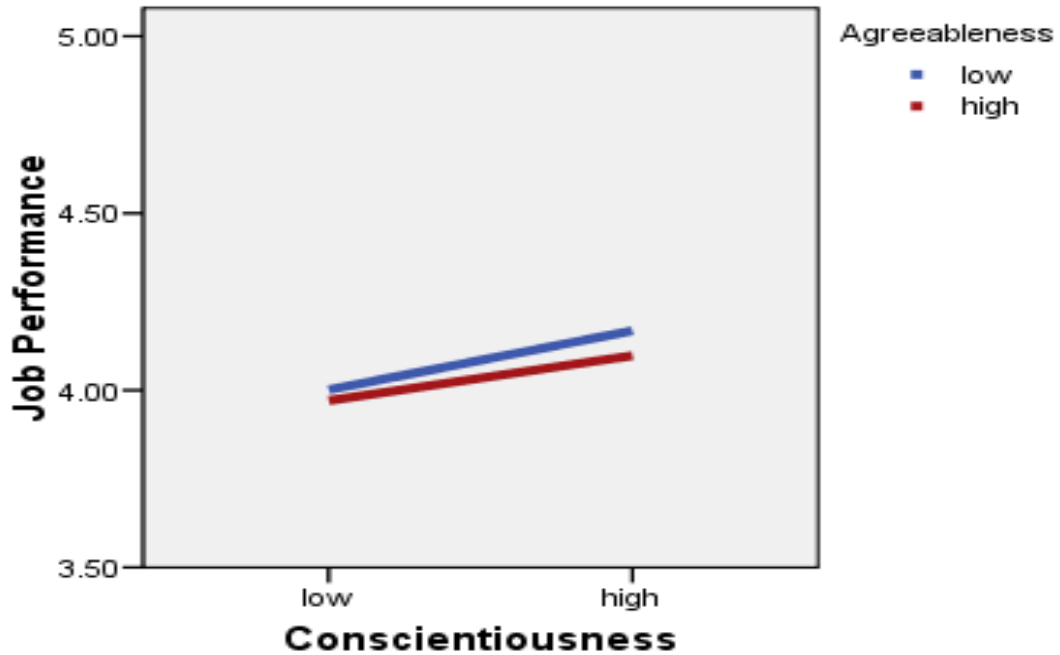
Figure 1. Relationship of Job Performance to Conscientiousness by Agreeableness.

services; or education and health. These categories are based on the U.S. Bureau of Labor Statistics' North American Industry Classification System (NAICS; BLS, 2004). However, the NCAIS has 20 sectors that I sorted into the five broader categories. The industries comprising each category, with the n, mean, and standard deviation of performance scores for each group, are presented in Table 5. The groups' performance scores did not vary significantly, ($F_{(4, 663)} = 1.18$, *n.*s). Correlations between performance ratings and the personality variables for each industry group can be found in Table 6; Group 1 (natural resources) was not included due to the small n.

Performance ratings in the trade, transportation, and utilities industry group were significantly correlated with the Extraversion by Neuroticism by Conscientiousness interaction term, ($r = .16$, $p < .01$). Whether incremental variance in performance was

Table 4

Hierarchical Regression of Performance Ratings on ExNxC

Variable	β Step 1	β Step 2	β Step 3
Step 1:			
Extraversion	.05	.41	.04
Neuroticism	.13**	.05	-.63
Conscientiousness	.16**	.65	.25
Step 2:			
ExN		.09	.65
ExC		-.72	-.11
CxN		-.04	.62
Step 3:			
ExNxC			-.60
R^2	.029**	.033**	.033**
ΔR^2	.029**	.004	.000

**p< .01

Table 5

Managerial Performance Scores by Industry

Industry	*n*	*M*	*SD*
Group 1: Natural resources	group n=9	4.48	.59
Agriculture, foresty, & fishing	2		
Natural resources	7		
Group 2: Construction & manufacturing	group n=119	4.02	.60
Food manufacturing/food processing	9		
Electrical/electrical manufacturing	24		
Other manufacturing	73		
Construction	13		
Group 3: Trade, transportation, & utilities	group n=393	4.05	.59
Wholesale trade	16		
Retail trade	353		
Transportation	14		
Utilities	10		
Group 4: Financial, business, & professional services	group n=114	4.09	.64
Banking & finance	35		
Insurance & real estate	39		
Professional services	11		
Services	24		
Multi-industry holding company	3		
E-companies	1		
Software	1		
Group 5: Education & Health	group n=33	4.15	.60
Healthcare	24		
Government	5		
Foundations & non-profits	2		
Education	2		

Note: total n=680, "other" or no response n=12.

explained by this term was again tested using hierarchical regression. See Table 7 for regression results. This interaction term did not explain additional variance in job performance above the trait scores and two-way interaction terms, ($\Delta R^2 = .001$, *n.s*). The interaction term Conscientiousness by Agreeableness was significantly correlated with managerial job performance in the education and health industry group ($r = .41$, $p < .05$). Moderated hierarchical linear regression results showed that the interaction term did not add significant incremental validity to the Conscientiousness measure, ($\Delta R^2 = .013$, *n.s*). Regression results for this industry can be found in Tables 8-10. The interaction terms, Extraversion by Neuroticism and Extraversion by Neuroticism by Conscientiousness, were also significantly correlated with performance ratings in this industry ($r = .43$, $p < .05$; $r = .56$, $p < .01$, respectively). Once again, hierarchical regression results showed that the interaction terms did not explain variance beyond the control variables. Note that in Table 10 the two-way interaction terms were not included in the regression. This was a result of the colinearity tolerance statistic dropping below .000; SPSS would not produce an estimate for the regression weight for the ExNxC term. As the three-way interaction term does not explain variance beyond the single trait scores, testing the two-way interactions here is unnecessary.

It is also important to note that the job performance ratings were negatively skewed (skew= -.57, min= 1.8, max=5). These ratings are subject to range restriction effects that attenuate the correlations presented here. Thus, the correlation coefficients may be underestimates of the true construct relationships and could explain the lack of support for the moderator hypotheses. The effects of range restriction on the data are discussed further in the next section.

Table 6

Correlations of Personality Traits with Performance Ratings by Industry

Group 2: Construction & manufacturing

Predictor	Job Performance
C	.10
A	-.06
E	.02
N	-.02
CxA	.03
ExN	.01
ExNxC	.08

Group 3: Trade, transportation, & utilities

Predictor	Job Performance
C	.15**
A	-.01
E	.01
N	.04
CxA	.10
ExN	.06
ExNxC	.16**

Group 4: Financial, business, & professional services

Predictor	Job Performance
C	.02
A	-.06
E	.05
N	.02
CxA	-.02
ExN	.05
ExNxC	.06

Group 5: Education & health

Predictor	Job Performance
C	.43*
A	.15
E	.17
N	.30
CxA	.41*
ExN	.43*
ExNxC	.56**

*p< .05; **p< .01

Table 7

Hierarchical Regression of Performance Ratings on ExNxC for Trade, Transportation, and Utilities Industry

Variable	β Step 1	β Step 2	β Step 3
Step 1:			
Extraversion	.03	.32	1.28
Neuroticism	.15*	.14	2.05
Conscientiousness	.21**	.53	1.52
Step 2:			
ExN		.02	-1.46
ExC		-.51	-2.08
CxN		-.01	-1.73
Step 3:			
ExNxC			1.43
R^2	.038**	.039*	.040*
ΔR^2	.038**	.002[a]	.001

*p< .05, **p< .01
[a]apparent discrepancy due to rounding

Table 8

Hierarchical Regression of Performance Ratings on CxA

for Education and Health Industry

Variable	β Step 1	β Step 2
Step 1:		
Conscientiousness	.41*	-.92
Agreeableness	.06	-.82
Step 2:		
C x A		1.75
R^2	.186*	.199*
ΔR^2	.186*	.013

*$p < .05$

Table 9

Hierarchical Regression of Performance Ratings on ExN

for Education and Health Industry

Variable	β Step 1	β Step 2
Step 1:		
Extraversion	.40*	-.24
Neuroticism	.49*	-1.08
Step 2:		
ExN		1.40
R^2	.217*	.234*
ΔR^2	.217*	.016

*$p < .05$

Table 10

Hierarchical Regression of Performance Ratings on

ExNxC for Education and Health Industry

Variable	β Step 1	β Step 2
Step 1:		
Extraversion	.31	1.13*
Neuroticism	.49**	2.40*
Conscientiousness	.41*	1.78*
Step 2:		
ExNxC		-2.17
R^2	.375*	.454**
ΔR^2	.375*	.079

*p< .05, **p< .01

Discussion

This study examined whether personality traits interact to predict managerial work performance. Conscientiousness was significantly related to performance ratings, supporting Hypothesis 1. This result is consistent with meta-analytic findings that Conscientiousness is the best personality predictor of performance in complex jobs (Barrick & Mount, 1991). Agreeableness was expected to moderate this relationship such that those high in both conscientiousness and agreeableness would receive the highest performance ratings. However, this interaction term did not explain incremental variance beyond the Conscientiousness measure, indicating that this trait predicts managerial performance equally well across levels of agreeableness.

The second hypothesized interaction was Extraversion by Neuroticism. Managers higher in Extraversion and lower in Neuroticism were expected to receive the highest performance ratings. This hypothesis was not supported. The three-way interaction between Extraversion, Neuroticism, and Conscientiousness also failed to contribute incremental validity. Thus, the trait interactions examined in this study did not aid in the prediction of managerial job performance. Interestingly, Extraversion was not a significant predictor in this study. Extraversion was significantly related to managerial job performance in Barrick and Mount's (1991) meta-analysis and was the strongest predictor of leadership ratings in Bono & Judge's (2004) meta-analysis. Perhaps those who did not project sufficient gregariousness and social dominance would not have advanced to this position, thus, this sample of incumbents would all be adequately

extraverted to manage people well. This possible range restriction is described further in the discussion of study limitations.

Management is classified as an enterprising job context in the RIASEC model (Holland, 1996). Foster and Macan found that Agreeableness and Conscientiousness interacted to predict job performance in realistic and conventional jobs, but not in enterprising jobs. The other career types (investigative, artistic, and social) were not examined in their study. This study replicates their findings that individual personality scales, rather than trait interactions, predict job performance in enterprising job environments. As these types of jobs are more competitive and achievement-oriented, the behavioral tendencies associated with Conscientiousness, such as setting goals and being self-disciplined, may be the main drivers of success.

Study Strengths

This study advances the growing literature on moderators of the personality- job performance relationship by showing that traits do not appear to moderate the predictive validity of other traits for manager jobs. A pervasive problem in job performance research is the quality of the criterion scores. Specifically, when performance ratings are used to make administrative decisions such as promotions and salary increases, supervisors tend to give more lenient ratings (Bernardin & Orban, 1990). However, in this study, supervisors were aware that the performance ratings were being collected for research purposes only, and held no administrative consequences. Therefore, in this study it is unlikely that the ratings were subject to any systematic rating error.

The personality measure used here was developed and validated by experts using a sound methodology for writing and choosing items that reflect the work context and

generalize across countries. Thus, this measure is particularly useful for predicting work outcomes and selecting personnel within a cross-national applicant pool. Further, managers from diverse industries and organizations comprised the sample. This adds to the external validity of the study for the larger managerial population.

Practical Implications

Although trait interactions have been shown to explain incremental variance in performance ratings in clerical jobs, jobs with high interpersonal components, and jobs in realistic and conventional contexts (Burke & Witt, 2002; Witt, Burke, Barrick, & Mount 2002; Foster & Macan, 2006), they do not appear to contribute to the prediction of overall managerial job performance. Human resource professionals looking to hire new managers are encouraged to select applicants based on Conscientiousness scores, as well as other skills and abilities deemed vital to the job via job analysis. Personality tests are particularly useful managerial selection tools as they do not produce adverse impact as do some tests of cognitive ability and they require less time and money than assessment centers. As conscientiousness was only modestly correlated (r=.14) with job performance, these measures are recommended to be used in conjunction with other selection tools. The most efficient use of personality tests in the hiring process is as a prescreening hurdle; applicants who pass a preset cut score on Conscientiousness should proceed to participate in structured interviews, situational judgment tests, and/or assessment centers to get a more complete picture of the candidate's strengths and likelihood for success on the job.

Limitations and Directions for Future Research

This study examined the relationships between personality interactions and job performance for managerial incumbents. Therefore some restriction of range in the predictors and criterion is likely to have attenuated the correlations presented here. Specifically, if the managers were hired using personality measures or a correlated test, those scoring very low would not have been selected, restricting the range of scores on the GPI scales. Similarly, low performing managers are less likely to be retained in the organizations, eliminating some of the lower scores on the criterion as well. The true effects of range restriction on the validity of trait interactions can be examined using a longitudinal, predictive-validity study design.

The criterion measure in this study consisted of five items directed at overall managerial performance. The impact of level of Agreeableness on Conscientiousness, or Neuroticism on Extraversion, may only be relevant for specific managerial competencies, such as coaching or motivating subordinates. The performance measure used here did not assess specific competencies or skills, thus I was not able to look at the interactive effects of traits for dimensions of managerial job performance. Future researchers may wish to explore these relationships. Specifically, Agreeableness may moderate the effectiveness of Conscientiousness for interpersonal functions such as coaching and mentoring. Those highest in Agreeableness are likely to perform better as suggested by Witt et al.'s (2002) study that found support for the Conscientiousness by Agreeableness interaction in jobs with primarily interpersonal requirements. Further, they are less likely to engage in high-maintenance behaviors that may annoy subordinates and discourage them from approaching the manager (Burke & Witt, 2004).

Further, the trait interactions tested in this study were chosen from theory and review of previous findings on this topic; however, other interactions may exist that do explain incremental variance in overall managerial performance ratings. For example, Burke and Witt (2002) found evidence that Openness to experience interacted with both Extraversion and Neuroticism to predict incremental variance in job performance for clerical workers. These interactions were not tested in this study. Research has also shown that some traits not directly measured in the five factor framework may be related to managerial performance. Proactive personality appears to be one that is important for predicting leadership charisma (Crant & Bateman, 2000) and may moderate the effectiveness of Conscientiousness. It may also be that the more specific facets of personality traits interact to predict overall or competency performance ratings.

A final direction for future research relates to the manager's level in the organization. High level managers may serve more influencing and persuading functions, requiring them to be more extraverted. These executive level leaders are responsible for setting the vision and mission of their organizations and influencing employees to subscribe to the organization's values and goals, whereas low to mid level managers are typically involved in monitoring subordinates' performance and dealing with day-to-day work issues. In executive leaders, the tendency toward social dominance and persuasiveness represented by higher Extraversion scores would likely contribute to the efficacy of the achievement-striving and self-efficacy facets of Conscientiousness. Future research may wish to examine these interactions within a sample of executive leaders.

Conclusion

The trait interaction hypotheses in this study were unsupported. Results from this study and previous research (Barrick & Mount, 1991) indicate that Conscientiousness is the most useful personality trait for selecting managerial personnel. Personality tests are best used in concert with other valid selection tools, such as assessment centers and structured interviews.

Although the interactions tested here did not contribute incremental validity to the prediction of managerial job performance, additional research should address whether these findings hold for specific job competencies rather than overall performance, for other personality trait interactions, and for all levels within the hierarchical structure of the organization.

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Appendices

Appendix A

GPI Personality Dimensions and Facets (from Schmit, Kihm, and Robie, 2000, p. 28)

Agreeableness

- Consideration

- Empathy

- Interdependence

- Openness

- Thought agility

- Trust

Conscientiousness

- Attention to detail

- Dutifulness

- Responsibility

- Work focus

Extraversion

- Adaptability

- Competitiveness

- Desire for achievement

- Desire for advancement

- Energy level

- Influence

- Initiative

43

- Risk-taking

- Sociability

- Taking charge

Neuroticism

- Emotional control (reverse-scored)

- Negative affectivity

- Optimism (reverse-scored)

- Self-confidence (reverse-scored)

- Stress tolerance (reverse-scored)

Openness to Experience

- Independence

- Innovativeness/creativity

- Social astuteness

- Thought focus

- Vision