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Relationship of Personality to Performance Motivation: A Meta-Analytic Review

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This article provides a meta-analysis of the relationship between the five-factor model of personality and 3 central theories of performance motivation (goal-setting, expectancy, and self-efficacy motivation). The quantitative review includes 150 correlations from 65 studies. Traits were organized according to the five-factor model of personality. Results indicated that Neuroticism (average validity = $-.31$) and Conscientiousness (average validity = $.24$) were the strongest and most consistent correlates of performance motivation across the 3 theoretical perspectives. Results further indicated that the validity of 3 of the Big Five traits—Neuroticism, Extraversion, and Conscientiousness—generalized across studies. As a set, the Big Five traits had an average multiple correlation of $.49$ with the motivational criteria, suggesting that the Big Five traits are an important source of performance motivation.

Personality has had an uneven history in work motivation research. Most researchers would implicitly agree that there are individual differences in motivation, and these differences can be traced to dispositional tendencies. However, research on the possible dispositional basis of motivation has been conducted in a sporadic and piecemeal fashion. In response to the question of what is known about individual differences in motivation, Austin and Klein (1996) commented, “Despite studies addressing individual differences within each of the perspectives, a considerable amount of research is needed before precise statements can be made about their role” (p. 239). Gellatly (1996) noted that “attempts to empirically link personality characteristics with motivational variables have produced inconsistent results” (p. 474). Finally, Kanfer and Heggstad (1997) concluded, “Until recently, the status of traits in most work motivation theories has been like that of a distant and not well-liked relative attending a family reunion” (p. 13).

What explains this relative disarray in the literature? One possible explanation is a lack of theoretical progress and conceptual clarity in the motivational area itself. After all, nothing—traits included—can predict the path of a moving target. However, motivation research has made substantial theoretical progress, and with respect to the theory for which arguably the most progress has been made—goal-setting theory—the situation is no more clear. As Locke, Shaw, Saari, and Latham (1981) noted in their seminal review, “The only consistent thing about studies of individual differences in goal setting is their inconsistency” (p. 142).

A more likely explanation for the lack of progress in the personality–motivation literature lies on the trait side of the equation. This explanation is multifaceted. One limitation in research on the dispositional basis of motivation, as in many areas of industrial–organizational (I-O) psychology, is that a plethora of traits have been studied, making assimilation difficult. As Hogan and Roberts (2001) recently commented, “There are thousands of personality measures in the published literature” (p. 6). These authors commented further that past personality research was “sprawling in conceptual disarray, with no overarching theoretical paradigm and the subject matter was operationalized in terms of a large number of poorly validated scales with different names” (Hogan & Roberts, 2001, p. 7). With so many traits related to different aspects of motivation, it is no surprise that reviewers of the literature have come away unimpressed by the empirical findings (Kanfer, 1990).

A related limitation mentioned in the above quotation is the absence of a theoretical framework to organize the myriad traits that have been studied in the work motivation area. The following conclusions of several reviewers in this area have attested to this limitation:

A fundamental problem in the investigation of dispositional influences on work behavior stems from the current lack of a unified theoretical perspective for understanding how and which personality constructs influence the motivational system. (Kanfer, 1990, p. 155)

The examination of single traits may be of little value, however, since personality theorists generally agree that it is *systems* of traits that influence behavior dynamics. (Austin & Klein, 1996, p. 232)

One problem has been the propensity of researchers to study the effects of a narrow range of individual traits (e.g., need achievement, locus of control, and self-esteem) in the absence of a fundamental theoretical framework. (Gellatly, 1996, p. 474)

The purpose of this article is to advance understanding of the possible dispositional basis of work motivation by providing a

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quantitative review of the literature. We conducted this quantitative review using meta-analysis techniques to cumulate results across studies. Before describing the procedures and results of the meta-analysis, we describe the relation of traits to motivation. We organize our discussion of motivational traits according to the five-factor model, because of its impact and utility. First, we describe the five-factor model. Then, we discuss expected relations of the Big Five traits, as well as the four additional traits noted above, to work and task motivation.

The Five-Factor Model of Personality

If a consensual structure of traits is ever to emerge, the five-factor model is probably it. Tupes and Christal (1961) and Norman (1963) are commonly credited with discovering the Big Five. Only in the past 2 decades, however, has research on the Big Five traits become a serious area of investigation. Specifically, a robust set of five factors has been recovered from almost every major personality inventory and from analyses of the more than 15,000 trait adjectives in English and those in many other languages (Goldberg, 1990). Furthermore, the structure has generalized across cultures, sources of ratings, and measures (John & Srivastava, 1999). Evidence has also indicated substantial heritability of the traits (e.g., Loehlin, 1992). Although acceptance of the classification is far from universal (see Block, 1995; Eysenck, 1992), the Big Five has provided the most widely accepted structure of personality in our time.

Neuroticism, often labeled by the positive pole of the trait Emotional Stability, is the tendency to show poor emotional adjustment in the form of stress, anxiety, and depression. Extraversion represents the tendency to be sociable, dominant, and positive (Watson & Clark, 1997). Individuals who score high on Openness to Experience are creative, flexible, curious, and unconventional (McCrae, 1996). Agreeableness consists of tendencies to be kind, gentle, trusting and trustworthy, and warm. Finally, conscientious individuals are achievement-oriented and dependable (Barrick & Mount, 1991), as well as orderly and deliberate (Costa & McCrae, 1992).

Relationship of the Five-Factor Model to Performance Motivation

Before discussing the relationship of the Big Five traits to motivation, one must first stipulate what one means by motivation. Motivation can be defined in many different ways, and there are advantages in general definitions and theories of motivation. In Naylor, Pritchard, and Ilgen's (1980) theory, for example, the target of motivated behavior is the maximization of anticipated affect. Most motivation researchers in I-O psychology, however, have been concerned with a more specific direction of behavior, namely the motivation to perform (Locke, 1997). Indeed, three of the most commonly investigated motivation theories in I-O psychology—goal-setting theory, expectancy theory, and self-efficacy theory—all have as their ultimate criterion the prediction of job performance, as meta-analyses of each of these theories has demonstrated (Stajkovic & Luthans, 1998; Van Earde & Thierry, 1996; Wright, 1990). Another unifying factor in these three theories is their cognitive orientation. In fact, the cognitive nature of the concepts in these theories has led to numerous efforts to unify and assimilate the three theories (Hollenbeck, 1987; Locke, 1997;

Locke, Motowidlo, & Bobko, 1986). Given the compatibility of these approaches and their frequency of study in I-O psychology, we focus our quantitative review on the relationship of personality to motivation as operationalized according to goal-setting, expectancy, and self-efficacy theories.

Because the purpose of this meta-analysis is to explore the relationship between the five-factor model of personality and the three theories of performance motivation, hypotheses are not provided. Nevertheless, there is reason to believe that relationships exist with respect to several Big Five traits. Barrick, Mount, and Strauss (1993) and Gellatly (1996) linked Conscientiousness to goal-setting motivation. Evidence indicates that neurotic individuals are less likely to be goal-oriented (Malouff, Schutte, Bauer, & Mantelli, 1990) though this area has been studied less than conscientiousness and goal-setting motivation. With respect to neuroticism and self-regulation, Kanfer and Heggestad's (1997) model predicts that anxiety leads to poor self-regulation because anxious individuals are not able to control the emotions necessary to protect on-task attention, and trait anxiety is closely related to Neuroticism (Kanfer, Ackerman, & Heggestad, 1996).

The relationship of the other three Big Five traits to performance motivation is less clear. Barrick et al. (1993) found that Extraversion was not correlated with goal commitment, but it was correlated with goal level ($r = .19, p < .05$). (This result was not discussed.) Although discussion of the possible link between Extraversion and motivation is lacking in the literature, positive affect—one of the indicators of Extraversion (Watson & Clark, 1997)—is related to distal and proximal measures of motivation (George & Brief, 1996). The relationships between motivation and the remaining Big Five traits—Agreeableness and Openness to Experience—are virtually unstudied. We could not locate any studies in the literature that included an explicit discussion of the effects of these traits on motivation. On the one hand, this is logical as the nature of the traits would appear to be less relevant to performance motivation. On the other hand, we are surprised that the motivation literature contains no discussion of these traits whatsoever.

Method

Literature Search

To identify all possible studies that estimate relationships between personality traits and measures of motivation, we performed an independent search for each theory of motivation (goal-setting, expectancy, and self-efficacy theories). We searched the PsycINFO database for studies (articles, book chapters, dissertations) published between 1887 and 2000 that referenced personality and key words relevant to the three theories of motivation (e.g., goal setting, goals, expectancy, self-efficacy). Sixty-four terms relevant to personality traits (e.g., locus of control, dominance) and 45 terms associated with personality measures (e.g., NEO-PI, Hamburg Personality Inventory) were used in each search. These efforts resulted in the identification of a total of 2,118 abstracts.

Rules for Inclusion in the Meta-Analysis

In reviewing the selected abstracts, we eliminated studies that did not appear to include any discernible measure of personality and those that assessed a trait that was not classifiable in terms of the five-factor model. Studies that did not appear to have measured motivation and studies that clearly did not include primary data (e.g., most book chapters) were also excluded.

For the remaining 327 journal articles and 217 doctoral dissertations, we examined each study to determine whether it contained a measure of personality, a criterion measure, and the data necessary to compute a correlation between the two. Several exclusionary rules were established. First, many studies failed to report the data necessary to obtain a correlation (e.g., studies that reported percentages or proportions, studies that reported means with no standard deviations, and studies that reported analysis of variance results). Second, we excluded studies that included traits that did not fall within Barrick and Mount's (1991) classification of existing measures into the Big Five traits. Specifically, we excluded studies wherein the personality measure was a combination of more than one trait or could not be clearly identified as a personality trait subsumed within the five-factor model. Thus, such traits as Type A, Proactive Personality, or typologies such as the Myers-Briggs Type Indicator were not included.

For the criteria, we excluded studies that did not include direct measures of self-set goal level or difficulty, expectancy, or performance self-efficacy. For example, a relatively large number of studies manipulated goal difficulty by assigning participants to different goal conditions (i.e., assigned goals), some studies assessed the efficiency of goal-setting training programs, whereas others measured the discrepancy between goals and performance across tasks. Studies that measured expectancy or self-efficacy motivation with regard to an immediate task were included. However, the task needed to be actual versus hypothetical and the motivation needed to concern task or job performance. Thus, we included studies focused on task motivation in training programs and those concerning academic performance, but excluded studies of criteria other than task-oriented motivation (e.g., smoking cessation) or motivation in influencing others' performance (e.g., teacher self-efficacy beliefs with regard to students' performance). Sixty-five journal articles and doctoral dissertations met these criteria; these studies are listed in the References section and denoted with an asterisk. We also obtained 18 estimates of personality-motivation correlations from unpublished raw data. Several studies reported data collected from multiple independent samples. Thus, in all, 150 correlations from 78 independent samples reported in 65 studies and 4 raw data sets were included in the analyses. With studies reporting correlations between multiple measures of a trait and motivation (e.g., Gellatly, 1996, reported correlations between six conscientiousness subscales and goal-setting motivation), we computed a single estimate using composite correlations when trait intercorrelations were reported or using simple averages when such intercorrelations were not reported (Hunter & Schmidt, 1990).

Data Classification

Criterion measures were classified into three categories corresponding to the three theories of motivation examined. Goal-setting studies (34% of the correlations) generally measured goal level (e.g., salespersons indicated the number of units they targeted as their sales goal; typists set performance goals in terms of lines per week) or goal difficulty (in terms of respondents' choices of tasks varying in difficulty levels). Studies included in the expectancy category (25% of the correlations) measured expectancy by asking respondents to indicate their perceptions of whether working on an activity would result in attaining a specific outcome. For example, respondents were asked to rate the extent to which they felt they would be successful on various job activities if they tried hard, or to estimate the number of items that they could answer correctly in a specific time period if they worked on only that type of item. Three studies combined expectancy with instrumentality and valence by multiplying or summing the three components. Finally, self-efficacy studies (41% of the correlations) mainly asked respondents to indicate their self-efficacy to perform a task or job (e.g., salespersons estimated their ability to sell).

Personality measures were classified according to the coding procedure developed and used by Barrick and Mount (1991). Specifically, in their meta-analysis, they classified personality measures on the basis of decisions made by six expert judges.¹ For example, the experts classified the Dominance and Sociability subscales from the California Psychological

Inventory (Gough, 1957) as measures of Extraversion, and classified the Autonomy scale from the Personality Research Form (Jackson, 1967) as a measure of Openness to Experience. We followed their classification closely, with the following exceptions: (a) Obviously, direct measures of the Big Five traits, such as those using the NEO Personality Inventory (Costa & McCrae, 1992), were included²; (b) nine studies using measures of trait anxiety were included because research indicates that these measures assess Neuroticism (Zuckerman, Joireman, Kraft, & Kuhlman, 1999); (c) one study that used the Methodical Weberian scale from Kirton Adaptation-Innovation Inventory (Kirton, 1976) was considered to have assessed Conscientiousness (as it includes items such as "I am thorough" and "I master all details painstakingly") and thus was included in the analyses; and (d) self-esteem, locus of control, and generalized self-efficacy scales were classified as measures of Neuroticism in light of research suggesting that these traits correlate strongly with Neuroticism (Judge, Erez, & Bono, 1998) and, in fact, appear to represent the same factor (Judge, Locke, Durham, & Kluger, 1998).

Meta-Analysis Procedures

Using the meta-analytic methods of Hunter and Schmidt (1990), correlations from individual samples were first corrected for measurement error in both the predictor and the criterion. We performed no correction for range restriction or dichotomization. Finally, we estimated a true score (population) correlation for each of the predictors with the criteria. A relatively large proportion of studies reported reliability estimates (internal consistencies) for the measures of personality traits and motivation on the basis of original samples (predictor reliability was provided by primary study authors for approximately two thirds of the correlations and criterion reliability was provided for more than one third of the correlations). When reliabilities for personality or motivation measures were not reported, we used the mean of the reliabilities reported for the relevant personality trait or motivation category.³

In addition to reporting estimates of the true score correlations, it is also important to describe variability in the correlations. Accordingly, we report 80% credibility intervals and 90% confidence intervals around the estimated population correlations. Although some meta-analyses reported only confidence intervals (e.g., Ernst Kossek & Ozeki, 1998) whereas others reported only credibility intervals (e.g., Vinchur, Schippmann, Switzer, & Roth, 1998), it is important to report both because each provides unique information. Confidence intervals provide an estimate of the variability around the estimated mean correlation; a 90% confidence interval excluding zero indicates 95% confidence that the average true correlation is nonzero. Credibility intervals provide an estimate of the variability of individual correlations across studies; an 80% credibility interval excluding

¹ The six judges in Barrick and Mount (1991) were trained raters, five of whom had received their doctorates in psychology and were experienced with personality assessment and one who was a doctoral student familiar with personality research. Traits were classified only if at least five of the six raters agreed, or if four of the six raters agreed and Barrick and Mount concurred. Barrick and Mount reported 95% agreement. In this study, we coded the traits and criteria independently. Across the traits and criteria, we agreed in 96% of the cases. The few disagreements were resolved by discussion and consensus.

² Barrick and Mount (1991) included few direct measures of the Big Five traits because, at that time, few were available. The situation has changed appreciably since then, but even so, only a minority of the correlations in our study utilized direct measures of the Big Five traits.

³ The mean reliabilities for measures of motivation were .85 for goal-setting measures, .65 for expectancy measures, and .76 for self-efficacy measures. The mean reliabilities for personality measures were as follows: Neuroticism = .83; Extraversion = .83; Openness to Experience = .80; Agreeableness = .81; Conscientiousness = .85.

zero indicates that at least 90% of the individual correlations in the meta-analysis were greater than zero (for positive correlations, less than 10% are zero or less, and a maximum of 10% lie at or beyond the upper bound of the interval). Thus, confidence intervals estimate variability in the mean correlation whereas credibility intervals estimate variability in the individual correlations across the studies. Finally, as we discuss shortly, we examined several moderators (study setting, study design, publication status) of personality–job performance relations.

Results

Table 1 provides results linking the traits to goal-setting motivation. Neuroticism was the strongest correlate of goal-setting motivation, followed by Agreeableness and Conscientiousness. Both the confidence intervals and credibility intervals excluded zero for all Big Five traits, indicating that we could be confident that all of the traits displayed nonzero relations with goal-setting motivation.⁴ Table 2 provides results linking the Big Five traits to expectancy motivation. Neuroticism and Conscientiousness were again the strongest correlates of expectancy motivation. These correlations—as well as that of Extraversion—were consistent with the goal-setting motivation analysis. However, both Openness to Experience and Agreeableness exhibited weaker correlations with expectancy motivation relative to goal-setting motivation, and the signs of both correlations were reversed. Finally, meta-analysis results linking the Big Five traits to self-efficacy motivation are provided in Table 3. The results for Neuroticism and Conscientiousness were consistent with the other results.⁵ However, Extraversion also was a moderately strong correlate of self-efficacy motivation. Across the three criteria, the number of correlations for Extraversion, Openness to Experience, and Agreeableness was quite small, perhaps widening the credibility and confidence intervals.

Moderator Analysis Results

Across the three motivational criteria and the five personality traits, 59% of the variability in the correlations was explained by study artifacts. With 41% of the variability in the correlations unaccounted for, we investigated several moderators: (a) study setting (work vs. academic), (b) study design (concurrent vs. longitudinal measurement of personality and motivation), and (c) publication status (published vs. unpublished data).⁶ Table 4 presents the results of the moderator analyses.⁷

Results show that studies conducted in work settings reflected, on average, slightly higher magnitudes of the personality–motivation relationships than did studies conducted in academic settings (*k*-weighted averages of .34 vs. .27, respectively), but the moderator effect was not consistent across traits and criteria. Similarly, studies that used longitudinal designs to collect personality and motivation data reflected lower estimates than those that used concurrent designs (*k*-weighted average of .24 vs. .32, respectively). Publication status of the data moderated the reported personality–motivation correlations; meta-analytical estimates from published studies were consistently larger than those resulting from unpublished reports or data (*k*-weighted averages of .32 vs. .25, respectively). Even though the variability in the correlations (measured by the corrected standard deviation) generally decreased in the moderated categories relative to the overall analyses, this effect was not consistent across traits and motivational criteria (see Table 4), suggesting that part of the differences

between correlations estimated in moderating categories is due to second-order sampling error.

Multivariate Results

As Kanfer (1990) and Austin and Klein (1996) have noted, it is important to investigate the dispositional correlates of motivation in an integrated framework. Accordingly, we sought to determine the multivariate relationship between the set of Big Five traits and motivation. Using Hunter's (1992) regression program, we regressed motivation on the Big Five traits. To form the correlation matrix that served as input into the program, we used the meta-analytic estimates of the relationship between the Big Five traits and performance motivation in Tables 1–3, and Ones, Viswesvaran, and Reiss's (1996) meta-analytic estimates of the intercorrelations among the Big Five traits. The sample size used for each regression was equal to the average sample size of all studies in the analysis (Viswesvaran & Ones, 1995), ranging from $N = 125$ for expectancy motivation to $N = 229$ for self-efficacy motivation.

The regression results are provided in Table 5. As is shown in the table, two Big Five traits—Neuroticism and Conscientiousness—were significant predictors of performance motivation across the criteria, independent of the effect of the other traits included in the regression. Extraversion and Openness to Experi-

⁴ The three most commonly studied traits in the motivation literature are self-esteem, locus of control, and need for achievement (Hollenbeck, 1987; Kanfer & Heggestad, 1997; Mitchell, Thompson, & George-Falvy, 2000). Following the classifications in prior research, we classified measures of self-esteem and locus of control as measures of Neuroticism and measures of need for achievement as measures of Conscientiousness. The validity of these individual traits was similar to the Big Five traits they were considered to indicate. For example, for goal-setting motivation, the results were as follows: self-esteem ($k = 7$), $\rho = .27$; internal locus of control ($k = 8$), $\rho = .30$; need for achievement ($k = 13$), $\rho = .28$.

⁵ Because generalized self-efficacy was considered to be an indicator of (low) Neuroticism, some might see it as tautological to relate generalized self-efficacy to task-specific self-efficacy motivation. In reality, however, generalized self-efficacy, as a distal motivational trait, is related to, but distinct from, task-specific self-efficacy, a proximal motivational state (Chen, Gully, Whiteman, & Kilcullen, 2000). Furthermore, even if the three correlations between generalized self-efficacy and self-efficacy motivation were removed from the analysis, the results would be nearly identical to those reported in Table 3 ($[k = 29] \rho = .35$; both the 80% credibility and 90% confidence intervals excluded zero).

⁶ Moderator analyses investigated the extent to which prospective moderator variables impacted the relationships between Neuroticism and Conscientiousness, and the three motivational criteria. For the other three traits, the number of estimates was relatively small, which would lead to unstable estimates of the true-score effect in moderator categories. Furthermore, five of the nine meta-analyses investigating the effects of Extraversion, Openness to Experience, and Agreeableness on the three motivational criteria accounted for all of the variance in the primary estimates (SD_p was zero), which indicates that no moderator effects were present in these estimates.

⁷ Meta-analytical evidence for the presence of moderators requires that (a) true estimates are different in the categories formed by the potential moderator variable and (b) the mean corrected standard deviation within categories is smaller than the corrected standard deviation computed for combined categories. Accordingly, Table 4 presents true-score correlations (ρ) and corrected standard deviations (SD_p) for each category formed by the proposed moderator variables.

Table 1
Relationships Between the Big Five Personality Traits and Goal-Setting Motivation

Trait	Average					80% CV lower	80% CV upper	90% CI lower	90% CI upper
	<i>k</i>	<i>N</i>	<i>r</i>	ρ	<i>SD</i> _{ρ}				
Neuroticism	19	2,780	-.24	-.29	.06	-.36	-.21	-.33	-.24
Extraversion	5	498	.13	.15	.00	.15	.15	.07	.24
Openness to Experience	4	262	.15	.18	.00	.18	.18	.06	.30
Agreeableness	4	373	-.24	-.29	.21	-.56	-.02	-.06	-.52
Conscientiousness	18	2,211	.22	.28	.07	.19	.36	.23	.33

Note. Null values for *SD* _{ρ} (standard deviation of true score correlation) indicate that differences in the primary correlations, after correction for unreliability, are smaller than or equal to differences expected to result from sampling error. *k* = number of correlations; *N* = combined sample size; ρ = estimated true score correlation; CV = credibility interval; CI = confidence interval.

ence were significant predictors of goal-setting and self-efficacy motivation, and Agreeableness was a significant negative predictor of goal-setting motivation. Perhaps the most meaningful statistic was the strong and significant multiple correlation between the five-factor model and performance motivation (average $R = .49$).

Discussion

The trait perspective is somewhat of an enigma in motivation research. Though motivation researchers appear to be sympathetic with dispositional variables (e.g., Hollenbeck, 1987), personality variables do not play a prominent role in most motivation theories. For example, the core tenets of goal-setting theory, expectancy theory, and self-efficacy theory do not include dispositional traits. Trait variables have been investigated in these theories (e.g., Hollenbeck & Brief, 1987). Nevertheless, the status of trait variables with respect to these theories in particular, and motivation research in general, is dubious. As Kanfer and Heggstad (1997) noted, "Although relatively few researchers would argue that traits should *not* be included in a comprehensive account of work motivation, previous work with trait constructs has proved problematic and unsatisfying" (p. 13).

Results from the quantitative review presented herein suggest a fairly consistent pattern of results. Neuroticism was negatively related to each of the theoretical perspectives on performance motivation. Similarly, Conscientiousness was positively related to

all three motivational criteria. The other Big Five traits—Extraversion, Openness to Experience, and Agreeableness—generally displayed weaker correlations with the motivational criteria, and the direction of the correlations was somewhat inconsistent across criteria. Because the numbers of correlations in the meta-analyses for Openness to Experience and Agreeableness were the smallest among the Big Five traits, the inconsistencies may result from second-order sampling error.

These results, as well as the strong multiple correlations between the traits and performance motivation, suggest important support for the trait perspective in motivation research. Why were the results of the present review so positive when past conclusions were so equivocal? We believe there are two reasons. First, in interpreting their results linking the five-factor model to job performance, Barrick and Mount (1991) commented, "The results illustrate the benefits of using this classification scheme to communicate and accumulate empirical findings" (p. 17). We believe the same advantages apply to the present study. Because many traits previously considered in isolation can be effectively housed under the five-factor umbrella, the findings in the personality-motivation literature may have yielded more than has been assumed. Indeed, this is one of the primary benefits of the five-factor model. Digman (1989) noted that "many reviewers despaired at the lack of organization in the field of personality . . . a great majority—if not all—of our verbally based personality constructs can be housed somewhere within that [five-factor] structure, bringing an

Table 2
Relationships Between the Big Five Personality Traits and Expectancy Motivation

Trait	Average					80% CV lower	80% CV upper	90% CI lower	90% CI upper
	<i>k</i>	<i>N</i>	<i>r</i>	ρ	<i>SD</i> _{ρ}				
Neuroticism	11	1,770	-.21	-.29	.17	-.51	-.07	-.40	-.18
Extraversion	6	663	.07	.10	.00	.10	.10	.02	.17
Openness to Experience	5	567	-.06	-.08	.00	-.08	-.08	-.16	.00
Agreeableness	5	875	.09	.13	.00	.13	.13	.07	.20
Conscientiousness	11	1,487	.16	.23	.09	.12	.34	.16	.30

Note. Null values for *SD* _{ρ} (standard deviation of true score correlation) indicate that differences in the primary correlations, after correction for unreliability, are smaller than or equal to differences expected to result from sampling error. *k* = number of correlations; *N* = combined sample size; ρ = estimated true score correlation; CV = credibility interval; CI = confidence interval.

Table 3
Relationships Between the Big Five Personality Traits and Self-Efficacy Motivation

Trait	Average					80% CV lower	80% CV upper	90% CI lower	90% CI upper
	<i>k</i>	<i>N</i>	<i>r</i>	ρ	SD_{ρ}				
Neuroticism	32	6,730	-.29	-.35	.18	-.58	-.13	-.42	-.29
Extraversion	7	2,067	.24	.33	.16	.12	.53	.20	.45
Openness to Experience	3	755	.15	.20	.04	.15	.25	.12	.28
Agreeableness	6	1,099	.09	.11	.17	-.10	.33	-.04	.26
Conscientiousness	14	3,483	.17	.22	.15	.03	.42	.14	.31

Note. *k* = number of correlations; *N* = combined sample size; ρ = estimated true score correlation; SD_{ρ} = standard deviation of true score correlation; CV = credibility interval; CI = confidence interval.

orderliness to a field long in need of one" (p. 196). In using the five-factor model to classify and organize these myriad traits, this study may shed more light on the dispositional basis of motivation.

Second, meta-analysis often has brought clarity to literature shrouded in doubt. For example, it has been used to clarify the literature on intelligence tests in personnel selection decisions, the relationship between job satisfaction and job performance, and many other areas of research (Schmidt & Hunter, 2000). Although the personality-motivation area has been subjected to many previous qualitative reviews, often as part of broader reviews of the

motivation literature (Austin & Klein, 1996; Kanfer, 1990; Kanfer & Heggstad, 1997; Locke, 1997; Locke et al., 1981; Mitchell, Thompson, & George-Falvy, 2000), the present study is the first meta-analysis on the subject. Qualitative reviews have their merits, but as Rosenthal (1998) noted, "Even the best reviews of research by the most sophisticated workers have rarely told us much more about each study in a set of studies than the direction of the relationship between the variables investigated and whether or not a given significance level was attained" (p. 372). Given the uncertainty in previous qualitative reviews regarding the trait per-

Table 4
Moderator Analyses

Trait/moderator	Motivation criteria								
	Goal-setting			Expectancy			Self-efficacy		
	<i>k</i>	ρ	SD_{ρ}	<i>k</i>	ρ	SD_{ρ}	<i>k</i>	ρ	SD_{ρ}
Study setting									
Neuroticism									
Work settings	5	-.34 ^{a,b}	.00	7	-.39 ^{a,b}	.14	9	-.32 ^{a,b}	.10
Academic settings	14	-.27 ^{a,b}	.07	4	-.08 ^{a,b}	.00	23	-.37 ^{a,b}	.19
Conscientiousness									
Work settings	3	.37 ^{a,b}	.14	2	.44 ^{a,b}	.12	4	.23 ^{a,b}	.12
Academic settings	15	.26 ^{a,b}	.02	9	.21 ^{a,b}	.05	10	.21 ^a	.17
Study design									
Neuroticism									
Concurrent	7	-.27 ^{a,b}	.00	2	-.42 ^{a,b}	.10	12	-.36 ^{a,b}	.10
Longitudinal	8	-.41 ^{a,b}	.13	1	-.10 ^{a,b}	—	7	-.22 ^{a,b}	.11
Conscientiousness									
Concurrent	7	.36 ^{a,b}	.00	4	.22 ^{a,b}	.00	6	.30 ^{a,b}	.00
Longitudinal	4	.26 ^{a,b}	.08	3	.12 ^{a,b}	.00	4	.07	.12
Publication status									
Neuroticism									
Published data	13	-.30 ^{a,b}	.00	1	-.55 ^{a,b}	—	18	-.37 ^{a,b}	.19
Unpublished data	6	-.25 ^{a,b}	.11	10	-.26 ^{a,b}	.16	14	-.29 ^{a,b}	.14
Conscientiousness									
Published data	11	.30 ^{a,b}	.06	5	.30 ^{a,b}	.13	8	.23 ^{a,b}	.08
Unpublished data	7	.22 ^{a,b}	.03	6	.20 ^{a,b}	.03	6	.19	.26

Note. Null values for SD_{ρ} indicate that differences in the primary correlations, after correction for unreliability, are smaller than or equal to differences expected to result from sampling error. *k* = number of correlations; ρ = estimated true score correlation; SD_{ρ} = standard deviation of true score correlation.

^a 90% confidence interval excluding zero. ^b 80% credibility interval excluding zero.

Table 5
Regression of Motivation on the Big Five Traits

Trait	Goal-setting motivation (β/R)	Expectancy motivation (β/R)	Self-efficacy motivation (β/R)
Neuroticism (β)	-.31**	-.25**	-.25**
Extraversion (β)	.15*	.07	.27**
Openness to Experience (β)	.18*	-.13	.13*
Agreeableness (β)	-.51**	.03	-.06
Conscientiousness (β)	.35**	.15†	.18**
Multiple <i>R</i>	.63**	.36**	.49**

Note. With the exception of the multiple *R* statistics, table entries are standardized regression (β) coefficients.

† $p < .10$, two-tailed. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

spective, we believe these results contribute to motivation research in I-O psychology.

Turning to the specific results, the results for Neuroticism and Conscientiousness were especially consistent across the three motivational criteria. This is comforting, as highly variable results across the criteria would suggest that motivation according to one theory (at least in terms of its relation to personality) is quite different from motivation according to another theory. In short, our results suggest that individuals who display high levels of motivation when motivation is conceptualized and measured according to goal-setting theory are likely to be the same individuals who display high levels of motivation according to expectancy or self-efficacy theories. Because these motivation theories are compatible in a number of important ways (Locke et al., 1986), this result is not surprising.

The validity of Neuroticism and Conscientiousness should not be surprising in that these two Big Five traits are the most important correlates of job performance (Hurtz & Donovan, 2000; Salgado, 1997). If personality affects performance mostly through motivation, and Neuroticism and Conscientiousness are the best predictors of performance, then it would almost have to be the case that these two traits best predict performance motivation. One might wonder why Neuroticism tended to be a stronger correlate of performance motivation given that Conscientiousness is a stronger correlate of job performance (Hurtz & Donovan, 2000). A plausible explanation is that whereas Neuroticism primarily influences performance through motivation, Conscientiousness influences performance in other ways. For example, conscientious individuals are likely to be orderly and decisive (Saucier & Ostendorf, 1999), which may give these individuals an edge in many jobs.

Extraversion also emerged as a consistently nonzero correlate of performance motivation; the correlation of Extraversion with self-efficacy motivation was particularly noteworthy. Given that positive emotionality is a hallmark of extraverts (Watson & Clark, 1997), it makes sense that extraverts would have greater confidence in their abilities to perform. Openness to Experience and Agreeableness displayed inconsistent correlations with the motivational criteria. Specifically, Openness to Experience displayed positive, nonzero correlations with goal-setting and self-efficacy motivation, but negative correlations with expectancy motivation. Conversely, Agreeableness displayed a negative, nonzero correlation with goal-setting motivation but relatively weak, positive correlations with the other criteria. It is difficult to explain this

pattern of results, though some of it may be due to the relatively small number of correlations involved. When the number of correlations cumulated is small, meta-analytic results are valid and still superior to interpreting single study results (Hunter & Schmidt, 1990). However, because analyses based on a small number of correlations are subject to increased probability of second-order sampling error, the possibility that a larger-scale meta-analysis would produce a different result must be noted. With respect to the negative correlation between Agreeableness and goal-setting motivation, it seems possible that agreeable individuals set less ambitious performance goals because they are motivated more by communion (desire to be part of a larger spiritual or social community) than by agency (desire to achieve mastery or power; Graziano & Eisenberg, 1997).

Study artifacts explain most of the variability in the correlations. Nonetheless, a substantial amount of variability remains unexplained. Accordingly, we investigated several moderators. Overall, results indicated that published studies, cross-sectional studies, and studies conducted in work settings demonstrated higher levels of validity than unpublished studies, longitudinal studies, and those conducted in laboratory settings. The somewhat weaker results for laboratory studies are not surprising. Because most laboratory studies in the motivation literature focus on the manipulated variables, such “strong situations,” in which personality variables are tangential to the investigation, may understate dispositional influences (Weiss & Adler, 1984). The weaker results for longitudinal studies are also easy to understand given that validities involving individual differences generally deteriorate over time (Keil & Cortina, 2001). Weaker results for longitudinal studies also may support the effects of common method variance in personality–motivation relations. That published studies demonstrate higher validity is not surprising, either, as published studies might have more construct valid measures. Indeed, this result has been found in other studies, most recently with respect to the satisfaction–performance relationship (Judge, Thoresen, Bono, & Patton, 2001). It should be noted, though, that our moderator analyses were only possible with respect to two traits—Neuroticism and Conscientiousness. Fortunately, these were the traits for which overall validities were the highest, and thus the moderating effects most meaningful.

Though the meta-analytic findings reported here contribute to the motivation literature, several limitations are apparent. First, the number of correlations for some of the analyses is very small. This might cause one to question whether it is appropriate to cumulate results based on relatively few studies. Schmidt, Hunter, Pearlman, and Hirsh (1985) addressed this question directly in noting that although meta-analyses based on small numbers of studies may increase the variability in the effect sizes, they do not affect the mean estimates. Thus, estimates that are distinguishable from zero based on a small number of studies will very likely continue to be distinguishable from zero as evidence accumulates. Conceptually, even small meta-analyses are superior to the subjectivity and imprecision involved in interpreting primary study results. As Schmidt et al. (1985) noted, “Even with small numbers of studies and small *N*'s, meta-analysis is still the optimal method for integrating findings across studies. In the absence of such interim meta-analyses, psychologists would likely base judgments on the findings of individual studies or nonquantitative (i.e., narrative) reviews of the literature—both of which are much more likely to

lead to error. Thus, such meta-analyses are, in fact, very desirable" (p. 749).

Another limitation of this review is that personality–motivation relationships were analyzed according to only three theories of performance motivation. These theories are relatively cognitive and, with the exception of self-efficacy, distal explanations of motivation. More proximal measures, such as effort, persistence, and self-regulation (beyond self-efficacy) could be studied; however, there simply was not a sufficient number of correlations to cumulate results. That such data are lacking, of course, does not mean that personality is not relevant to these theories. In time, a meta-analytic review of personality–motivation relations should be able to include other theoretical perspectives on motivation.

Given the results presented herein, an important direction for future research is to test process models involving the Big Five traits. Although some research has appeared testing process models involving Conscientiousness and goal-setting motivation (Barrick et al., 1993; Gellatly, 1996), this involved only one of the Big Five traits that is potentially relevant to motivation and only one theory of motivation. Austin and Klein (1996) specifically called for more work motivation research utilizing other Big Five traits in addition to Conscientiousness. Kanfer and Heggstad (1997, 1999) have begun important work on a dispositional process model of motivation that involved traits closely related to two of the Big Five traits (Neuroticism and Conscientiousness). In light of the results presented in this quantitative review, these and other models need to be tested.

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Call for Nominations

The Publications and Communications (P&C) Board has opened nominations for the editorships of *Contemporary Psychology: APA Review of Books*, *Developmental Psychology*, and *Psychological Review* for the years 2005–2010. Robert J. Sternberg, PhD, James L. Dannemiller, PhD, and Walter Mischel, PhD, respectively, are the incumbent editors.

Candidates should be members of APA and should be available to start receiving manuscripts in early 2004 to prepare for issues published in 2005. Please note that the P&C Board encourages participation by members of underrepresented groups in the publication process and would particularly welcome such nominees. Self-nominations are also encouraged.

Search chairs have been appointed as follows:

- ***Contemporary Psychology: APA Review of Books***: Susan H. McDaniel, PhD, and Mike Pressley, PhD
- ***Developmental Psychology***: Joseph J. Campos, PhD
- ***Psychological Review***: Mark I. Appelbaum, PhD

To nominate candidates, prepare a statement of one page or less in support of each candidate. Address all nominations to the appropriate search committee at the following address:

Karen Sellman, P&C Board Search Liaison
 Room 2004
 American Psychological Association
 750 First Street, NE
 Washington, DC 20002-4242

The first review of nominations will begin November 15, 2002. The deadline for accepting nominations is November 25, 2002.