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**P = f (Ability x Conscientiousness): Examining
the facets of conscientiousness**



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$P = f(\text{Conscientiousness} \times \text{Ability})$: Examining the Facets of Conscientiousness

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We posited that the form of the joint effects of motivation and ability in traditional performance models are interactive because motivation triggers the use of energy resources required to deploy ability at work. Moreover, we posited that achievement might best represent motivation compared to five other facets of Conscientiousness or global Conscientiousness. In two samples of customer service representatives, achievement interacted with general mental ability (GMA) in predicting task performance, whereas global Conscientiousness and the other five facets did not. This suggests that researchers examining the motivational aspects of Conscientiousness might uncover a more consistent pattern of results for task performance if they focus on the achievement facet. Furthermore, managers might see the highest levels of task performance in certain contexts when hiring individuals based on both achievement and GMA.

Early theoretical models suggest that ability and motivation jointly affect performance, but the functional form of these models has never been fully specified. Namely, their effects may be either additive or interactive and may vary across operational definitions of ability, motivation, and performance (Campbell, 1976; Klehe & Anderson, 2007; Maier, 1955; Mitchell & Nebeker, 1973). In the present study, we proposed interactive effects, operationally defining ability as general mental ability (GMA), motivation as global Conscientiousness and six of its facets, and performance as core task performance. We suggest that increases in GMA or some aspects of Conscientiousness may dramatically improve task performance, whereas low levels of either GMA or Con-

scientiousness may reduce performance. We aimed to clarify whether it is particularly important to assess employee levels of both GMA and Conscientiousness (i.e., interactive) or if focusing on them independently may be sufficient (i.e., additive).

Ability reflects knowledge and cognitive capability. GMA is its most common operationalization and is often a selection criterion (Schmidt & Hunter, 1998). Motivation reflects (a) the choice to expend effort toward a specific activity (direction), (b) the choice of the level of effort to expend, and (c) the choice to maintain that level of effort until the job is complete (persistence; Campbell, 1990; Motowidlo, Borman, & Schmit, 1997). Although motivation may be conceptualized in a number of ways (e.g., intrinsic or extrinsic motivation and fulfillment of needs; Pinder, 1998; Ryan & Deci, 2000), a considerable literature has defined it in terms of motivation-oriented personality traits (Hollenbeck & Whitener, 1988; Motowidlo et al., 1997). If this is deemed an appropriate practice, it may be possible to assess a stable indicator of motivation during selection, in addition to ability.

Motowidlo et al. (1997) described personality as “abstractions that define potential for observable behavior” (p. 78) and highlighted its importance as a predictor of performance. Although motivation involves a decision, personality determines predispositions to act in a certain way, including whether one will make a decision to exert any level of sustained effort toward work tasks (e.g., Motowidlo et al., 1997; Mount, Barrick, & Strauss, 1999; Wright, Kacmar, McMahan, & Deleeuw, 1995). Therefore, personality may be an appropriate representation of motivation.

Of the Big Five personality traits, Conscientiousness is the strongest predictor of task performance across jobs (Barrick, Mount, & Judge, 2001; Behling, 1998; Goldberg, 1992; Schmidt & Hunter, 1998). Barrick and Mount (1993) described individuals high in Conscientiousness as “ideal employees” who are generally “responsible, dependable, persistent, and achievement-oriented” (p. 111). They tend to have technical expertise and an organized support network (McCrae & Costa, 1999). They are also skilled planners who maintain impulse control (e.g., act cautiously, delay gratification, and follow rules and norms), which often leads to enhanced task performance (John & Srivastava, 1999). Therefore, Conscientiousness is the personality trait that is perhaps most closely related to motivation to perform.

Empirical findings indicate that GMA and Conscientiousness independently predict a variety of job performance criteria across most jobs (e.g., Barrick & Mount, 1991; Barrick et al., 2001; Hunter, 1986). In an effort to assess whether their joint effects are interactive or additive, Mount et al. (1999) positioned Conscientiousness as motivation in three samples of managers and sales representatives, but the interaction did not explain unique variance in overall job performance in any sample. This is inconsistent with other empirical research testing the interactive hypothesis of job performance models (e.g., Kipnis, 1962; Wright et al., 1995).

We suggest that the operational definitions used for motivation may partially explain the mixed results. Namely, Mount et al. (1999) used a global measure of Conscientiousness, but a number of recent studies have shown that personality facets are equivalent or better predictors than global constructs (e.g., Ashton, 1998; Dudley, Orvis, Lebiecki, & Cortina, 2006; Hough & Ones, 2001; Hough & Oswald, 2005; Lepine, Colquitt, & Erez, 2000; Moon, 2001; Roberts, Chernyshenko, Stark, & Goldberg, 2005; Stewart, 1999). Although some dimensions of Conscientiousness are motivational in nature, others may attenuate or be simply unrelated to motivational tendencies (Moon, 2001; Roberts et al., 2005). To date, few researchers have examined the predictive validity of the narrow facets alongside Conscientiousness in predicting performance (Dudley et al., 2006). This was the focus of the present study. Because we were interested in clarifying the form of

Campbell's (1976) model of task performance, we proposed an interaction between motivation and ability, but we conceptualized motivation using each of the narrow facets in addition to an overall measure of Conscientiousness (Mount et al., 1999). To provide a stronger test of these relationships, we examined two separate samples of supervisor–subordinate matched employees, using supervisor-rated task performance. Therefore, in addition to testing whether the form of this relationship was indeed interactive, we also intended to clarify the appropriate use of Conscientiousness (i.e., global vs. facets) as a conceptualization of motivation.

THEORY AND HYPOTHESES

Conservation of Resources (COR) theory holds that individuals strive to obtain and maintain resources that serve as means to attain goals (Hobfoll, 1989). In general, individuals are unlikely to put forth effort to spend resources without sufficient motivation to do so. We propose that Conscientiousness and more specifically one of its facets, achievement, may trigger individuals to expend their valued resources to express GMA. Namely, GMA may be activated in the presence of Conscientiousness and especially achievement, but it may remain underutilized when these are low. Other narrow facets may also activate GMA, but as we describe next, we did not expect that any of these would be as appropriate in representing motivation as the achievement facet.

Conscientiousness and Its Facets as Motivation

Why might Conscientiousness and its facets act as motivational triggers for GMA? In addition to a consistent Conscientiousness–performance relationship (Schmidt & Hunter, 1992, 1998, 2004), meta-analytic findings suggest a positive link between Conscientiousness and goal-setting, expectancy, and self-efficacy, all central aspects of motivation theory (Gellatly, 1996; Judge & Ilies, 2002). Conscientiousness is typically described as either a predictor of achievement motivation (Hart, Stasson, Mahoney, & Story, 2007; Musson, Sandal, & Helmreich, 2004) or as including a tendency to be motivated as part of its conceptual definition (Pinder, 1998). However, it is also conceptualized as the composite of a number of distinct facets, many of which may or may not be aligned with motivation. In this study, we explored six facets of Conscientiousness, as defined by the Occupational Personality Questionnaire (OPQ; Saville, Holdsworth, Nyfield, Cramp, & Mabey, 1984)—achievement, order, dependability, forward-planning, competitiveness, and traditionalism.

To our knowledge, no studies have examined the interaction between GMA and the narrow facets of Conscientiousness as well as between GMA and global Conscientiousness in a single study. COR theory suggests that individuals need a motivational trigger to expend the resources required to deploy GMA in the pursuit of work-related tasks (Hobfoll, 1989). Therefore, we sought to shed light on the relative effects of global Conscientiousness and six of its facets as proxies for motivation in interacting with GMA to predict task performance.

Global Conscientiousness

Global Conscientiousness is frequently described as consisting of a number of distinct narrow traits, including achievement orientation, planning orientation, detail orientation, dependability,

and self-control (Dudley et al., 2006; McCrae & Costa, 1999; Roberts et al., 2005). Considered together, these facets comprise overall Conscientiousness, which may therefore act as a motivational trigger (Mount et al., 1999). Namely, the global trait may provide task focus, goal-setting competency, and a desire to succeed. For instance, high-conscientiousness individuals often have a high degree of self-control that may help them remain focused on work tasks. They are also likely to feel a sense of obligation to complete tasks and feel compelled to achieve status, recognition, and general success. These individuals are likely to plan ahead, whether setting their own goals or striving to meet assigned goals, and to work methodically toward goals, paying attention to details, proceeding cautiously, and following ascribed work methods. Together, many of these tendencies suggest that high-conscientiousness individuals are motivated to expend the energy required to deploy any available cognitive resources for the benefit of their employer (Dudley et al., 2006; Hobfoll, 1989; Mount et al., 1999; Roberts et al., 2005).

H1: Global Conscientiousness moderates the relationship between GMA and task performance, such that the positive GMA–performance relationship is stronger among workers high than low in global Conscientiousness.

However, scholars have also proposed that the narrow facets of Conscientiousness may cancel each other out when considered under the umbrella of global Conscientiousness (Moon, 2001; Roberts et al., 2005). This may explain why the narrow facets have emerged as at least equivalent but often better predictors than the global Conscientiousness construct. We explore this assertion in the following sections.

Achievement

Achievement (i.e., industriousness in Roberts et al., 2005) is the narrow facet of Conscientiousness that is most clearly aligned with motivation. It reflects the desire to exhibit high standards of performance (Dudley et al., 2006). It is based on need for achievement, a motivational disposition that reflects a need to pursue and achieve difficult tasks (McClelland, 1961; Murray, 1938). As a proactive trait, high achievement also predisposes people to go above and beyond to achieve success (Costa & McCrae, 1998). Therefore, individuals high in achievement are ambitious, hard working, and resourceful (Wright et al., 1995).

Achievement may also act as a motivational trigger for GMA because it is conceptually consistent with all three dimensions of motivation (i.e., direction, level, and persistence). Individuals high in achievement are likely to direct their energy toward work tasks because they typically strive to excel in their jobs. They are also likely to exert high levels of effort, directing available resources toward work tasks in efforts to achieve success. Finally, they are likely to persist until they accomplish their goals, because of their inherent need to succeed. Therefore, the conceptual basis of achievement clearly supports use of this facet as a proxy for motivation (McClelland, 1961; Wright et al., 1995).

Empirical evidence surrounding the relationship of achievement with performance further supports its use as a proxy for motivation. Namely, researchers have examined the main effects of this facet on performance and have discovered a pattern consistent with that of other operational definitions of motivation. For example, Stewart (1999) found that achievement exhibited strong correlations with the task performance of experienced employees. He concluded that achievement was a better predictor of task performance than global Conscientiousness, because its narrow definition

aligned with typical, narrow performance criteria. Similarly, Dudley et al. (2006) found that for task performance in managerial, skilled/semiskilled, customer service, and sales jobs, achievement exhibited a stronger relationship than other facets. In comparison to other facets of Conscientiousness, Roberts et al. (2005) found that achievement was among the strongest predictors of job dedication. Likewise, Reisert and Conte (2004) found that achievement was negatively associated with deviant behavior, and this association was stronger than for other facets of Conscientiousness.

A few studies have also tested the interactive effects of ability and need for achievement, the construct forming the conceptual basis for achievement. French (1958) found a significant interaction in predicting performance on problem-solving tasks among Armed Forces personnel. More recently, Wright et al. (1995) found that the interaction predicted overall supervisor-rated job performance for warehouse workers, such that the achievement–performance relationship was positive among those high in ability but negative among those low in ability. In one exception, Sackett, Gruys, and Ellingson (1998) failed to find a significant achievement \times ability interaction predicting task performance, actual promotions, and overall job performance among entry-level military personnel, management trainees, and bakery employees, respectively.

Therefore, despite some mixed results, the literature generally supports the notion that the achievement facet may drive the favorable results for Conscientiousness as a motivational construct. Achievement is also among the few facets common to most empirically based taxonomies of Conscientiousness (e.g., DeYoung, Quilty, & Peterson, 2007), with sound discriminant validity, and that consistently predict a variety of outcomes across a range of occupations (Dudley et al., 2006; Roberts et al., 2005).

Achievement and GMA

The achievement facet may act as a motivational trigger for GMA by specifically predisposing an individual to yearn for success, pride, or tangible rewards that result from goal achievement (Dudley et al., 2006; McClelland, 1961; Moon, 2001; Murray, 1938). Therefore, high-achievement employees likely deploy available resources, expending the effort required to apply GMA toward work goals (Hobfoll, 1989). As GMA increases, task performance may dramatically increase as it is combined with high levels of achievement. Therefore, we expected a robust, positive GMA–performance relationship among individuals high in achievement. In contrast, when individuals are low in achievement, they are not concerned with success or goal achievement. Even as GMA increases, low-achievement individuals are unlikely to expend energy to deploy their resources to express GMA in pursuit of work goals. As a result, we expected a weak GMA–performance relationship among low-achievement individuals.

- H2: Achievement moderates the relationship between GMA and task performance, such that the positive GMA–performance relationship is stronger among workers high than low in achievement.

Other Facets of Conscientiousness

Other narrow facets of Conscientiousness (e.g., order, dependability, forward planning, competitiveness, and traditionalism) may also align with the dimensions of motivation, but this correspondence is not as clear as it is for achievement. For instance, three facets may align with the direction

and persistence dimensions of motivation. First, order reflects the desire to apply structure to one's environment (Dudley et al., 2006). People high on order are thorough and methodical, autonomously monitoring their work and practicing effective time-management (Stewart, 1999). Therefore, these individuals may clearly know where to direct their efforts and as they monitor their progress they may persist until accomplishing their goals. Second, dependability (i.e., responsibility) predisposes individuals to feel and act upon a personal obligation to their employer (Sackett et al., 1998). Therefore, dependability may incline individuals to exert effort to work-related goals and to persist until they are complete, so as to meet perceived obligations. Finally, forward planning reflects a predisposition for planning one's work in advance. Goal-setting theory states that when individuals set specific, challenging, attainable goals and strategies to meet those goals, they perform at a high level (Locke & Latham, 2002). Therefore, individuals high on the trait of forward planning may clearly know where to direct their energy and they may persist until those goals are met.

None of these three facets, however, are clearly linked with the third dimension of motivation—level of exerted effort. For instance, even if individuals high on order apply a structured methodology as they strive to achieve goals, this may not determine the level of energy they exert as they work. Likewise, individuals high on dependability may feel obligated to meet task requirements but may or may not feel they have to complete them quickly or to high standards. Finally, individuals who routinely plan ahead may or may not exert a high level of energy while executing those plans.

Competitiveness is another narrow facet of Conscientiousness that is conceptually aligned with two out of three dimensions of motivation—level of exerted energy and persistence. Competitive individuals want to win or achieve more than others achieve (Bartram & Brown, 2005). Therefore, this trait may determine how hard individuals work at a particular pursuit and even how long they persist, but it does not necessarily determine in what direction individuals may exert these efforts (on- or off-task).

A final facet in the OPQ, traditionalism, determines to what extent individuals adhere to conventional processes and rules. This trait may determine an individual's general conduct but is not likely related to direction, level, or persistence of effort toward work-related tasks, and traditionalism may even undermine other motivational tendencies (e.g., a traditional person may not take on extra responsibilities for fear of breaking the norms). Thus, traditionalism is not theoretically linked to any of the dimensions of motivation.

Other Facets and GMA

Because order, dependability, forward planning, and competitiveness are each partially aligned with motivation, individuals with high levels of these four traits may experience some form of heightened motivation as a result of their personality profile. This may lead them to deploy resources toward task completion as GMA increases, resulting in a stronger positive relationship between GMA and task performance when any of these is high. Further, we did not expect traditionalism to be an appropriate proxy for motivation in interacting with GMA to predict task performance. But because these facets are not as clearly aligned with motivation as achievement, we proposed only an exploratory research question concerning these traits.

Exploratory Research Question: Do order, dependability, forward planning, competitiveness, and traditionalism moderate the relationship between GMA and task performance, such that the positive GMA–performance relationship is stronger among workers high than low in these traits?

METHOD

Participants and Procedure

We asked customer service representatives (CSRs) of two inbound call centers and their respective supervisors to contribute data to projects conducted for both applied and research purposes. We collected data from incumbents using a concurrent validation design. Sample 1 was from a financial services institution. Sample 2 was part of an insurance company. For both organizations, the chief executive of call center operations sent an e-mail to all CSRs, inviting them to participate in a voluntary survey that would be used to validate the selection process. Those who volunteered were told to go to a specific training room at a specific time to complete the paper-and-pencil survey. An external consultant, representing the testing company, administered the survey to the volunteers.

We collected complete data on 210 of 569 (37%) CSRs in Sample 1 and on 218 of 497 (44%) CSRs in Sample 2. The samples closely resembled the overall population of the respective call centers in terms of demographic characteristics (Sample 1: 68% women; 53% minorities; M age = 28.20 years, M tenure = 2.73 years; Sample 2: 76% women; 42% minorities; M age = 29.56 years, M tenure = 1.69 years).

Measures

Personality

We measured global Conscientiousness and its facets with established scales from Saville et al.'s (1984) Occupational Personality Questionnaire (OPQ32). The OPQ32 consists of six facet scales of Conscientiousness (i.e., achievement, competitiveness dependability, order, forward planning, and traditionalism), each assessed by an average of seven items. According to the test publisher (Bartram, Brown, Fleck, Inceoglu, & Ward, 2006), reliabilities for the subscales are α s = .82 (achievement), .80 (competitiveness), .75 (dependability), .79 (order), .83 (forward planning), and .82 (traditionalism). We also calculated global Conscientiousness as a composite (average) of all six facet scales. According to the test publisher, reliability is also good for the composite scale (α = .89; Bartram & Brown, 2005). The OPQ32 is a widely used selection instrument with a 5-point response scale, ranging from *strongly disagree* to *strongly agree*. It is especially popular in Europe and Asia (Bowen, Martin, & Hunt, 2002). There is evidence for its criterion-related validity (Robertson & Kinder, 1993; Saville, Sik, Nyfield, Hackston, & MacIver, 1996), and Beaujouan (2000) demonstrated support for the convergence of the five-factor model across seven countries using the OPQ. Due to proprietary restrictions, however, reliability estimates and other detailed information for the personality scales as used in our samples are only available from the test publisher (see also Lievens, Harris, Van Keer, & Bisqueret, 2003).

GMA

In Sample 1, the Watson-Glaser Critical Thinking Appraisal (Watson & Glaser, 1994) assessed GMA. This was a 60-min, 80-item timed test, in which the maximum possible score was 80 points

(1 point per item). In Sample 2, we measured GMA with a 35-item, timed, 20-minute data reasoning test that assessed the ability to use numerical data to answer questions (Saville & Holdsworth Ltd USA, Inc., 1996). Each correct answer was worth 1 point, so the maximum possible score was 35. Because the test was proprietary, we do not have access to reliability information for our sample. However, according to the test publisher, coefficient alpha for the test is approximately .88 (Saville & Holdsworth LTD USA, Inc., 1996).

Task Performance

Based on the results of job analyses and in consultation with line managers and human resources professionals in the respective organizations, we measured task performance with five items. Items differed between Samples 1 and 2 due to differences in job context. In Sample 1, the task performance items were (a) “[employee name] finds creative and effective solutions to work problems,” (b) “[employee name] works through problems independently,” (c) “[employee name] uses critical thinking skills to analyze customer problems,” (d) “[employee name] offers available alternatives in helping customers,” and (e) “[employee name] has a solid understanding of the business.” In Sample 2, the task performance items were (a) “[employee name] recognizes errors in the dollar amount of claims,” (b) “[employee name] works through problems independently as often as possible,” (c) “[employee name] spots errors and inconsistencies,” (d) “[employee name] solves customer problems resourcefully and effectively,” and (e) “[employee name] understands written information easily.” In both samples, supervisors responded using a 5-point response scale, ranging 1 (*weak, or bottom 10%*), 2 (*fair, or next 20%*), 3 (*good, or mid 40%*), 4 (*very good, or next 20%*), and 5 (*best, or top 10%*). Internal consistency reliability was good in both samples ($\alpha_s = .88$ and $.93$ in Samples 1 and 2, respectively).

We conducted confirmatory factor analyses to verify the factor structure of the task performance measures (see Table 1). To determine the fit of our measurement models, we used chi-square goodness-of-fit statistic, comparative fit index (CFI), Tucker–Lewis index (TLI; Tucker & Lewis, 1973), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). The suggested lower bound of good fit for CFI and TLI is .90 (Bentler & Bonett, 1980). The suggested upper bound of good fit is .05 for RMSEA and .08 for SRMR, whereas fit is reasonable at .08 for RMSEA and .10 for SRMR (Browne & Cudeck, 1993). We found support for a one-factor model in Sample 1, $\chi^2(5, N = 208) = 4.69, ns$ (CFI = 1.00, TLI =

TABLE 1
Confirmatory Factor Analysis Results for Task Performance

Sample	χ^2	df	RMSEA	TLI	CFI	SRMR	Mean Standardized Factor Loading ^a
Sample 1 (5 items) ^b	4.69	5	.00	1.00	1.00	.02	.77
Sample 2 (4 items) ^c	5.79	2	.09	.99	.98	.02	.86

Note. RMSEA = root mean square error of approximation; TLI = Tucker–Lewis index; CFI = comparative fit index; SRMR = standardized root mean square residual.

^aAll factor loadings were significant at $p < .01$. ^b $N = 208$. ^c $N = 218$.

1.00, RMSEA = .00, SRMR = .02), but the one-factor model did not fit the data in Sample 2 well, $\chi^2(5, N = 218) = 50.66, p < .01$ (CFI = .95, TLI = .90, RMSEA = .21, SRMR = .03). Therefore, we removed one item (i.e., “[employee name] spots errors and inconsistencies”) to improve the fit of the one-factor model ($\chi^2(5, N = 218) = 5.79, ns$, (CFI = .98, TLI = .99, RMSEA = .09, SRMR = .02) while retaining high reliability ($\alpha = .92$), although the RMSEA value was still just above the suggested upper bound of reasonable fit. We subsequently used this four-item measure of performance in Sample 2 for our analyses.

Analyses

We centered the predictors and conducted two separate hierarchical moderated regression analyses to test our hypotheses, one for global Conscientiousness and one for the six facets of Conscientiousness. Each analysis involved two steps. At the first step, we entered GMA and the main effects of the respective personality variable(s). At the second step, we entered the interaction term formed by multiplying the centered personality variable(s) entered at the first step with the centered GMA term.

RESULTS

Table 2 presents the descriptive statistics, reliability estimates, and intercorrelations. All facets (except traditionalism in Sample 1) were significantly correlated with Conscientiousness and GMA was not in both samples. The bivariate correlations for Conscientiousness, achievement, order, dependability, and GMA with task performance were positive and significant in Sample 2. Unexpectedly, however, none of these were significantly associated with task performance in Sample 1 (only forward planning exhibited a significant bivariate association with task performance in that sample).

Table 3 presents the results of the regression analyses on the data from Samples 1 and 2. First, we ran the moderated hierarchical regression analyses assessing the main and interactive effects of global Conscientiousness and GMA for both samples. As shown in Table 3, the main effects (Step 1) for global Conscientiousness and GMA ($R^2 = .03, p < .05$ and $R^2 = .09, p < .01$ for Samples 1 and 2, respectively) contributed significant unique variance in task performance in both samples. The interactive effects of global Conscientiousness and GMA (Step 2), however, were not significant at $p < .05$ for either sample. Therefore, H1 was not supported.

Next, we repeated the same analyses including all six facets of Conscientiousness in one regression model with GMA (main and interactive effects). In Step 1, the main effects did not contribute unique variance in task performance in Sample 1 ($R^2 = .06, ns$), but they did in Sample 2 ($R^2 = .11, p < .01$). In Step 2, the combined interactive effects contributed additional unique variance in both samples ($\Delta R^2 = .10, p < .01$ and $\Delta R^2 = .03, p < .05$, for Samples 1 and 2, respectively). As expected, and in support of H2, the achievement \times GMA interaction also accounted for significant unique variance in task performance in both samples ($\beta = .25, p < .01$ and $\beta = .17, p < .05$, respectively). The traditionalism \times GMA interaction also reached significance ($\beta = -.18, p < .05$) in Sample 1, but this significant effect was not replicated in Sample 2.

TABLE 2
Descriptive Statistics and Intercorrelations of Study Variables

Variable	Sample 1 ^a		Sample 2 ^b		I	2	3	4	5	6	7	8	9
	M	SD	M	SD									
1. Task performance	3.24	0.78	3.36	0.89	(.88/.92)	.14*	.14*	.18**	-.04	.14*	.04	.07	.27**
2. Global conscientiousness	22.57	2.19	25.26	2.24	.11	.61**	.69**	.69**	.45**	.77**	.23**	.76**	.11
3. Achievement	20.25	3.94	29.12	4.25	.13	.66**	.41**	.41**	.15*	.50**	-.14*	.51**	.15*
4. Order	27.28	3.89	28.74	3.27	.08	.38**	.28**	.28**	.06	.69**	-.09	.52**	.14*
5. Competitive	15.78	4.97	16.79	4.03	-.04	.71**	.30**	-.08	.02	.14*	.04	.12	-.01
6. Dependability	28.38	4.14	29.81	3.43	.01	.70**	.30**	.56**	.02	-.02	-.08	.62**	.09
7. Traditionalism	19.67	4.30	18.81	4.11	.04	.37**	-.04	-.04	-.22**	-.02	-.04	-.01	-.07
8. Forward planning	24.04	3.89	28.30	3.74	.14*	.70**	.37**	.51**	.01	.49**	-.04	-.01	.11
9. GMA	23.75	5.27	12.07	4.63	.13	-.02	-.06	.01	.00	-.12	.12	-.03	

Note. Sample 1 is presented below the diagonal. Sample 2 is presented above the diagonal. Reliability estimates are presented in the diagonal, with Sample 1 presented first and Sample 2 presented second. Reliability estimates for Conscientiousness and its facets are only available from the test publisher. The means for these measures equate approximately to a normally distributed, standardized 10-point scale as follows: 20 ~ '3', 30 ~ '6'. GMA = general mental ability.

^aN = 208. ^bN = 218.

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

TABLE 3
Hierarchical Moderated Regression Analyses Predicting Task Performance

Independent Variable	Sample 1				Sample 2			
	<i>b</i> (SE)	β	R^2	ΔR^2	<i>b</i> (SE)	β	R^2	ΔR^2
Global Conscientiousness								
Step 1			.03	.03*			.09	.09**
Conscientiousness	.04 (.02)	.11			.05 [†] (.03)	.11		
GMA	.02* (.01)	.14			.05** (.01)	.26		
Step 2			.04	.01 [†]			.10	.01
Conscientiousness	.03 (.02)	.09			.04 [†] (.03)	.11		
GMA	.02 [†] (.01)	.12			.05** (.01)	.26		
Con × GMA	.01 [†] (.00)	.12			.01 (.01)	.10		
Facets of Conscientiousness								
Step 1			.06	.06			.11	.11**
Achievement (A)	.03 [†] (.02)	.14			.02 (.02)	.08		
Order (B)	.00 (.02)	.02			.03 (.02)	.12		
Competitive (C)	-.01 (.01)	-.07			-.01 (.01)	-.05		
Dependability (D)	-.02 (.02)	-.08			.02 (.03)	.06		
Traditionalism (E)	.01 (.01)	.05			.02 (.01)	.08		
Forward Planning (F)	.02 (.02)	.12			-.02 (.02)	-.09		
GMA	.02 [†] (.01)	.13			.05** (.01)	.25		
Step 2			.16	.10**			.14	.03*
Achievement (A)	.03 [†] (.02)	.16			.03 (.02)	.13		
Order (B)	.01 (.02)	.07			.03 (.03)	.12		
Competitive (C)	-.02 [†] (.01)	-.13			-.01 (.01)	-.06		
Dependability (D)	-.01 (.02)	-.06			.01 (.03)	.04		
Traditionalism (E)	.01 (.01)	.05			.02 (.01)	.07		
Forward Planning (F)	.01 (.02)	.07			-.02 (.02)	-.10		
GMA	.01 (.01)	.05			.05** (.01)	.25		
A × GMA	.01** (.00)	.25			.01* (.00)	.17		
B × GMA	.00 (.00)	.11			.01 (.01)	.08		
C × GMA	-.00 (.00)	-.10			-.00 (.00)	-.04		
D × GMA	.00 (.00)	.07			-.01 (.01)	-.12		
E × GMA	-.01* (.00)	-.18			.00 (.00)	.08		
F × GMA	-.00 (.00)	-.12			.00 (.01)	.02		

Note. GMA = general mental ability.

[†] $p < .10$. * $p < .05$. ** $p < .01$.

None of the other interaction terms added significant unique variance in predicting task performance.

To identify the form of the significant achievement × GMA interaction in both samples, we plotted the GMA–task performance relationship at three levels of achievement (i.e., at the mean and 1 standard deviation below and above the mean; Aiken & West, 1991). Figures 1 and 2 present the plots for Samples 1 and 2, respectively. As shown in the figures, the GMA–task performance relationship appeared positive among workers high in achievement in both samples. The simple slope was significantly different from zero in both Sample 1 ($t = 3.30, p < .01$) and Sample 2 ($t =$

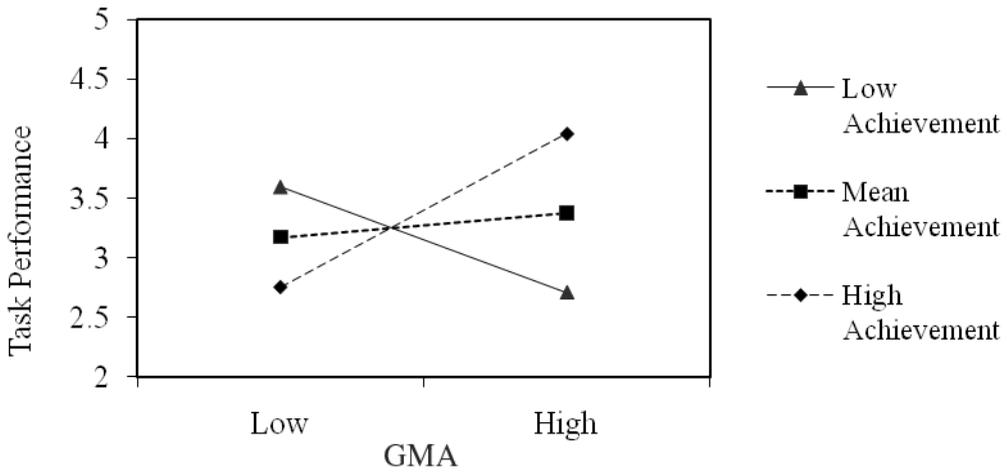


FIGURE 1 Plot of Achievement × GMA Predicting Task Performance (Sample 1).

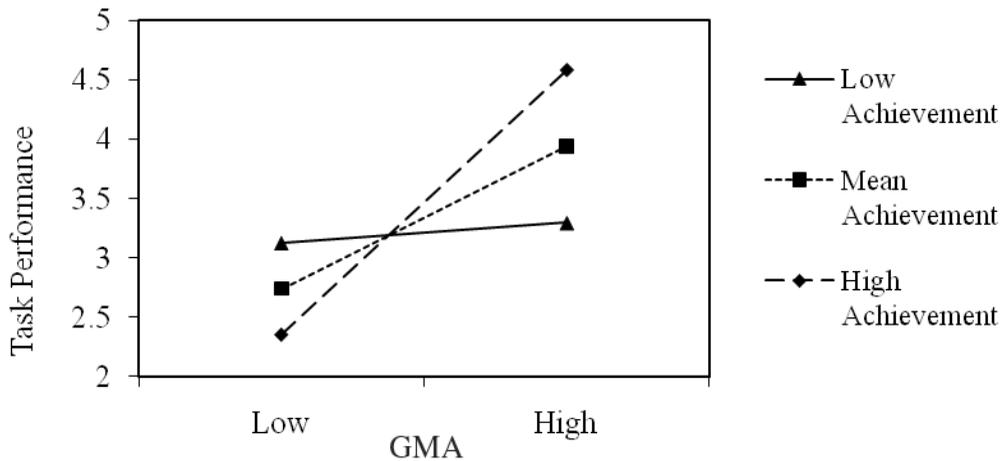


FIGURE 2 Plot of Achievement × GMA Predicting Task Performance (Sample 2).

4.57, $p < .01$; see Table 4; Aiken & West, 1991). The slope of the mean achievement group was also significantly positive in Sample 2 ($t = 3.54, p < .01$). The slopes of all other regression lines were not significantly different from zero.

We also plotted the significant traditionalism × GMA interaction for Sample 1 (see Figure 3). As shown, the GMA–task performance relationship was positive among individuals low in traditionalism ($t = 3.42, p < .01$) and negative among individuals high in traditionalism ($t = -2.03, p < .05$).

TABLE 4
Simple Slopes of Significant Interactions Predicting Task Performance

Group	Sample 1		Sample 2	
	Slope	t	Slope	T
Achievement × GMA				
Low achievement	-0.03	-1.63	0.01	0.32
Mean achievement	0.01	0.64	0.05**	3.54**
High achievement	0.04**	3.30**	0.09**	4.57**
Traditionalism × GMA				
Low traditionalism	0.05**	3.42**		
Mean traditionalism	0.01	1.00		
High traditionalism	-0.03*	-2.03*		

Note. GMA = general mental ability.
p* < .05. *p* < .01.

DISCUSSION

In response to mixed results in the extant literature (e.g., Motowidlo et al., 1997; Mount et al., 1999), we set out to clarify the form of the joint effects of ability and motivation in traditional job performance models (Campbell, 1976; Maier, 1955). Based on the tenets of COR theory (Hobfoll, 1989), we hypothesized that motivation activates the expenditure of energy required to deploy GMA, resulting in an interactive effect on task performance. We operationally defined motivation as global Conscientiousness and six of its facets to determine the most appropriate operationalization of motivation in terms of Conscientiousness. We expected that achievement, the facet most clearly theoretically aligned with the three dimensions of motivation (i.e., direction, level, and persistence of effort), would exhibit interactive effects with GMA in predicting task performance.

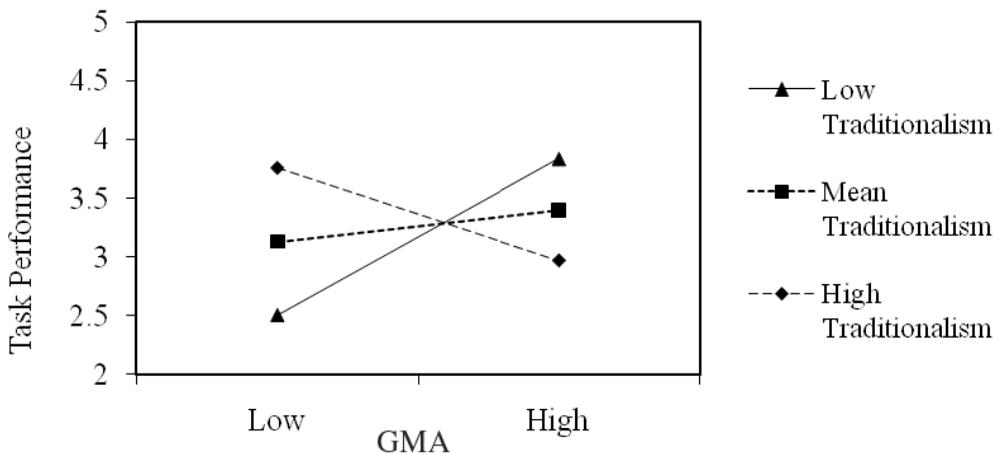


FIGURE 3 Plot of Traditionalism × GMA Predicting Task Performance (Sample 1).

However, the remaining facets (i.e., order, dependability, forward planning, competitiveness, and traditionalism) are only somewhat aligned or not aligned with motivation. Thus, we empirically explored whether these other facets would exhibit interactive effects.

Our findings across two samples supported the interactive effects of motivation and ability in predicting task performance, but only when motivation was operationally defined as achievement. The interaction was not significant when motivation was defined as global Conscientiousness or as other facets of Conscientiousness, with the exception of traditionalism for Sample 1. Moreover, the main effect of global Conscientiousness was not significant, suggesting that the multiple dimensions of Conscientiousness may have attenuated effects of the motivation-oriented facets (Moon, 2001). Neither the main nor interactive effects of order, dependability, forward planning, or competitiveness were significant in either sample, suggesting they may not be appropriate proxies for motivation, despite their conceptual tie-in with some of the dimensions of motivation.

With regards to traditionalism, it seems that in certain contexts a predisposition to stick to traditional rules and processes may actually attenuate the effect of ability on task performance. That is, we found the strongest positive GMA–task performance relationship among individuals with low levels of traditionalism. In contrast, this relationship was significantly negative among individuals with high levels of traditionalism. We hypothesized that traditionalism would be unrelated to motivation and perhaps inhibit individuals from taking on new tasks or challenges; these results suggest the latter may be true. But because this finding did not replicate in Sample 2, we urge caution in interpreting these results. We encourage further study of this particular facet and its effect on the GMA–performance relationship.

Therefore, based on these findings, we suggest that achievement may be the most appropriate personality-based proxy for motivation, compared to global Conscientiousness and any of its other facets. We also suggest that its joint effects with ability may be interactive rather than additive in predicting task performance; this provides some insight to the true form of Maier's (1955) job performance model, $P = f(M \times A)$.

Strengths, Limitations, and Directions for Future Research

We offer four specific strengths of the present study. First, by considering the interactive effects of six facets of Conscientiousness with GMA on task performance in two independent samples, we may have uncovered a central role for achievement as a motivational construct. This sheds light on the form of the Ability \times Motivation interaction and illustrates the importance of examining narrow personality traits, especially in concert with narrow outcomes (e.g., Ashton, 1998; Dudley et al., 2006; Hough & Oswald, 2005). To our knowledge, we are the first to test the $P = f(M \times A)$ performance model by considering the joint effects of GMA with global Conscientiousness and its facets within a single study (e.g., Stewart, 1999). Second, we found consistent results with achievement in two different samples. This helps to increase the confidence in our results, as previous research has shown that replication is particularly important for interactions (Golding, 1975). Third, the variance explained by the achievement \times GMA interaction was a moderate effect size for interactions typically found in nonexperimental studies, suggesting that it has practical significance as well as statistical significance (Champoux & Peters, 1987; Chaplin, 1991). Finally, our measures of Conscientiousness and its facets from the OPQ are specifically designed to reflect personality at work. Hirschfeld, Lawson, and Mossholder (2004) found that context-specific achievement motivation did interact with GMA, whereas general achievement motivation did not.

However, they looked at student subjects in semester-long workgroups in one sample, including only general achievement and academic achievement motivation. Our use of the OPQ with private sector workers permitted us to identify which of the six motivation-oriented facets of Conscientiousness interacted with GMA in a real-world setting.

We also recognize several limitations of the present study that point to a number of avenues for future research. First, we could not test the incremental prediction of the facets over and above global Conscientiousness because we used a mathematical composite measure rather than a distinct global measure. Therefore, replication is needed using a distinct global Conscientiousness measure from that of the facets. Second, both samples were composed of customer service representatives. In their meta-analysis, Dudley et al. (2006) found that the facets of Conscientiousness exhibited differential relations with job performance based on the jobs involved in sample. Thus, future studies with respondents from other industries, professions, and job levels would help to shed further light on performance models and answer questions regarding the generalizability of our results. Third, our data were cross-sectional, so we cannot establish causality. Although GMA and personality are stable traits that do not likely change as a result of one's performance (Barrick et al., 2001), longitudinal studies would provide additional evidence for the validity of our conclusions. Fourth, because our measures for personality and GMA were proprietary, we were unable to provide standard metrics of reliability for those measures in our sample.

Finally, our results exhibited some minor inconsistencies across samples. Namely, bivariate correlations between most of the predictors and task performance in Sample 1 (see Table 2) and a main effect of GMA when controlling for facets of Conscientiousness in Sample 1 unexpectedly failed to reach significance at $p < .05$. Regarding the nonsignificant correlations, although these relationships are well-established (Schmidt & Hunter, 1998), we have two reasons to believe that this may not be a major cause for concern. First, the results of the tests of the achievement \times GMA interaction replicated in Sample 2, in which we found the expected bivariate correlations for all study variables. This suggests that our overall conclusions may still be valid. Second, the nonsignificant correlations in Sample 1 may be a result of the specific task performance measure we used for those participants, which was different than in Sample 2. Namely, the task performance items in Sample 1 assessed general problem solving and understanding of the business, whereas the items in Sample 2 were more detailed, assessing understanding of written information and customer-specific problem solving. The items in Sample 2 clearly involved detailed cognitive tasks, but those in Sample 1 may have required other forms of ability (in addition to GMA), perhaps explaining why the bivariate correlations of GMA and personality with task performance were not significant. This may also explain the nonsignificant main effect of GMA on task performance when modeled with the facets in Sample 1. But the fact that we found a significant interaction between GMA and achievement predicting task performance in both samples suggests that the joint effects of these particular variables may function the same way in both contexts. Nonetheless, additional replication would be desirable.

We invite future researchers to consider building on our efforts by investigating other specific criterion variables, such as contextual performance, creativity, and leadership effectiveness. For example, dependability may be more likely to interact with GMA in the prediction of contextual performance, because employees may actively employ their cognitive resources toward citizenship behaviors out of personal obligation to the organization. Finally, we suggest replicating these efforts in other occupational types; this is a crucial step to understand the generalizability of our

findings. In all of these endeavors, we suggest that it is important to consider the effects of global Conscientiousness and its facets in the same sample, so as to compare their relative effects.

Practical Implications

Our results may imply avenues for improving selection processes. Previous research has demonstrated the efficacy of making hiring decisions based on GMA and Conscientiousness (e.g., Barrick & Mount, 1991; Hunter, 1986). Our results indicate that the best selection decisions in customer service settings may result from collecting both achievement and GMA scores. Our findings also highlight the importance of motivation even when employees possess high levels of GMA, stemming from the validity of the interactive hypothesis. Specifically, efforts on the part of managers to motivate low-achievement, high-GMA employees may be necessary to move them toward high levels of performance, because they may lack personal motivation. In both samples, the lowest levels of task performance resulted when employees were high in GMA but were low in achievement. Thus, managers might use caution when hiring those who have high ability but lack an orientation toward high achievement. If incumbents possess low-motivation, high-ability trait combination, managers might consider training or reward programs to increase achievement motivation.

Conclusion

An abundance of research has accumulated showing that GMA and Conscientiousness are both strong and consistent predictors of job performance. We believe there is still a great deal to learn about the relationships among these variables and encourage researchers to use this study as a starting point for further research efforts on narrow traits and the $P = f(M \times A)$ performance model.

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