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RESEARCH REPORTS

The Interactive Effects of Conscientiousness and Agreeableness on Job Performance

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The authors hypothesized that the relationship between conscientiousness and job performance would be stronger for persons high in agreeableness than for those low in agreeableness. Results of hierarchical moderated regression analyses for 7 independent samples of employees across diverse occupations provided support for the hypothesis in 5 of the samples. In samples supporting the hypothesis, among the highly conscientious workers, those low in agreeableness were found to receive lower ratings of job performance than workers high in agreeableness. One explanation for lack of an interaction between conscientiousness and agreeableness in the other 2 samples is that those jobs were not characterized by frequent, cooperative interactions with others. Overall, the results show that highly conscientious workers who lack interpersonal sensitivity may be ineffective, particularly in jobs requiring cooperative interchange with others.

In personality research, conscientiousness has been the most consistent and universal predictor of job performance (Barrick, Mount, & Judge, in press). Surprisingly, there is a paucity of research examining whether a conscientious employee's standing on other personality traits affects how successful he or she is in the workplace. In other words, certain personality traits may interact with others to result in desirable, as well as undesirable, workplace behaviors. Hogan, Hogan, and Roberts (1996) cautioned researchers against examining personality constructs on an individual basis because the way in which each trait operates depends, in part, on the pattern of other traits.

Personality and Performance

Many scholars have embraced the five-factor model of personality (FFM) as a replicable and unifying taxonomy of personality

(e.g., Digman, 1990; Goldberg, 1992). This model advances conscientiousness, agreeableness, extraversion, emotional stability, and openness to experience as five distinct traits that predict work attitudes and behaviors. Meta-analytic studies have shown that conscientiousness and emotional stability have been the most consistent FFM predictors of performance (e.g., Barrick et al., in press; Salgado, 1997), whereas other FFM constructs are relevant in specific jobs or criteria. Recent primary studies have indicated that personality tests can account for significant incremental validity beyond that accounted for by biodata (e.g., McManus & Kelly, 1999), mental ability (McHenry, Hough, Toquam, Hanson, & Ashworth, 1990), assessment centers (Goffin, Rothstein, & Johnston, 1996), and interviews (e.g., Cortina, Goldstein, Payne, Davison, & Gilliland, 2000).

Conscientiousness

Workers high in conscientiousness are predisposed to be organized, exacting, disciplined, diligent, dependable, methodical, and purposeful. Thus, they are more likely than low-conscientiousness workers to thoroughly and correctly perform work tasks, to take initiative in solving problems, to remain committed to work performance, to comply with policies, and to stay focused on work tasks. Recent research has revealed that managers perceive cognitive ability and conscientiousness as the most important attributes related to applicants' hirability (Dunn, Mount, Barrick, & Ones, 1995). Barrick et al. (in press) performed a second-order meta-analysis of previous meta-analytic studies that examined personality-performance relationships and reported that conscientiousness was the only FFM construct to predict supervisory ratings of job performance across jobs and organizations. However,

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they also reported variability in the validities of conscientiousness across studies ($\rho = .23$; 90% credibility values range from .10 to .35). In fact, the mean observed correlations between conscientiousness and performance typically hover in the low teens (e.g., $r = .10$ in Salgado, 1997). The variability and the small size of the correlations suggest the presence of moderators.

Agreeableness

Agreeableness, or likability (Hogan, 1986), refers to such traits as selflessness, cooperativeness, helpfulness, tolerance, flexibility, generosity, sympathy, and courtesy (Digman, 1990). Some researchers have suggested that agreeableness is the primary concept to consider in the assessment of individual differences (e.g., Havill, Besevegis, & Mouroussaki, 1998). However, agreeableness seems to be most relevant to job performance in situations in which joint action and collaboration are needed (Mount, Barrick, & Stewart, 1998). Work contexts having a fairly high level of interpersonal interaction require selflessness, tolerance, and flexibility. Agreeable persons tend to deal with conflict cooperatively or collaboratively, strive for common understanding, and maintain social affiliations (Digman, 1990).

Conscientiousness \times Agreeableness

Limited research exists on the interaction of individual differences on performance. Most personality–performance studies have examined the moderating influence of mental ability (e.g., Wright, Kacmar, McMahan, & Deleuw, 1995) or situational variables, such as autonomy (e.g., Barrick & Mount, 1993) and organizational politics (Hochwarter, Witt, & Kacmar, 2000). Although prior published research has stopped short of analyzing interactions among personality variables (e.g., high conscientiousness in the absence of agreeableness), support for a “constellation approach” to examine personality’s influence on work behavior is occasionally called for in the literature (Hogan et al., 1996; Organ, 1996). In light of this gap, researchers have identified the need to expand models of the personality–job performance relationship to account for cross-dimensional effects of personality traits (Hogan et al., 1996; Wright et al., 1995). However, we are unaware of any published research on interactions among the Big Five traits in predicting performance.

We suggest that a particularly relevant interaction effect exists between conscientiousness and agreeableness in explaining job performance. It has been argued that when highly conscientious people lack interpersonal competence, dysfunctional outcomes may result (Goleman, 1998). Recent findings in the contextual performance literature (e.g., McManus & Kelly, 1999; Van Scotter & Motowidlo, 1996) add empirical support to this contention. Specifically, Kiker and Motowidlo (1999) found in a lab experiment using a managerial in-basket simulation that technical effectiveness pays off more in supervisory reward decisions for people who are interpersonally effective. Logically then, this finding suggests that workers who are technically effective (i.e., of which conscientious is a key component) should be rated more favorably if they also exhibit interpersonal effectiveness (i.e., agreeableness).

Perhaps it is counterintuitive to think that high levels of conscientiousness could in any way be associated with less effective behaviors. Other factors being equal, individuals who are high on

conscientiousness perform better than those who are low on conscientiousness (Barrick & Mount, 1991). However, if other factors, such as relevant personality traits, are not equal, individuals may be less effective despite their high conscientiousness. For example, when conscientious individuals are also highly disagreeable (i.e., vengeful, hostile, inconsiderate, uncooperative, or aloof), they are likely to lack important interpersonal skills. As expected, low levels of agreeableness have been associated with lower contextual performance (McManus & Kelly, 1999; Motowidlo & Van Scotter, 1994) and with antisocial or dysfunctional behaviors (Cortina, Doherty, Schmitt, & Kaufman, 1992) in prior empirical studies.

Ultimately, highly conscientious, highly disagreeable people may be perceived as micromanaging, unreasonably demanding, inflexible, curt, and generally difficult to deal with, suggesting that conscientiousness and agreeableness may interact in the prediction of performance. Because of predispositions to work hard and interact cooperatively with others, workers high in conscientiousness and agreeableness are likely to be more effective. In contrast, without the tendency to be cooperative, considerate, and trusting (i.e., low in agreeableness), conscientiousness will likely add little to performance.

Hypothesis: The relationship between conscientiousness and supervisory ratings of job performance is stronger among workers high in agreeableness than among those low in agreeableness.

We attempted to provide a rigorous test of this hypothesis by examining it across multiple diverse samples with varying occupations. Specifically, we investigated the hypothesized relationship by using seven samples with jobs of different content. Although this interaction is likely strongest in jobs requiring substantial cooperative interaction (because traits associated with agreeableness are most relevant in these situations), our data were part of larger test validation studies, thereby allowing cooperative action to be quantified only in a post hoc fashion. Thus, we considered this aspect of our study to be exploratory.

Method

Participants and Procedure

As part of a series of concurrent validity studies, we collected data from employees and their supervisors in one public-sector and six private-sector organizations. We described the purposes of the study and the procedures to the workers and assured them that their responses would be treated confidentially.

Sample 1. As part of a larger study (Mount, Witt, & Barrick, 2000), we collected complete data on 371 clerical workers in a private-sector organization; 84% were women. Their functions were in support of either internal or external customers. Their tasks required some interdependence with their coworkers.

Sample 2. As part of a larger study (Hochwarter et al., 2000), we collected complete data on 271 sales agents of a private-sector organization; 70% were women. Although workers interacted primarily with external customers, they occasionally interacted with coworkers in a supporting role.

Sample 3. We collected complete data on 206 sales representatives in a large appliance manufacturing organization. The typical participant was male, was in his late 30s, had a college degree, and had 10 years of tenure in the organization. The sales representatives generated sales from distributors in a well-defined geographical region. The distributors were long-standing customers; typical interactions involved dealing with customer

service issues as well as generating future sales. Data for 91 of these 206 subjects were previously reported in a study by Barrick, Mount, and Strauss (1993).

Sample 4. As part of a larger study (Mount et al., 1998), we collected complete data on 250 production workers in a manufacturing plant that relied on work teams to organize jobs. On average, the teams had been intact for 5 to 6 years, and members' average tenure within the teams was 4 years. Participants were primarily male (69%), were in their mid-40s, had at least a high school degree and some college courses, and had more than 15 years of tenure with the plant. The teams had extensive self-leadership responsibilities, but they were not fully self-autonomous (e.g., they did not make firing decisions).

Sample 5. As part of a larger study (Mount et al., 1998), we collected complete data from 273 production workers in another manufacturing plant organized using teams (average team tenure > 5 years; average member tenure within the teams was 3 years). The typical participant was male, was in his early 40s, had a high school degree and some college courses, and had more than 14 years of tenure in the firm. These teams shared leadership responsibilities between the supervisor and the team.

Sample 6. Our public-sector data came from 146 civilian managers participating in the U.S. Army Management Training Program (Barrick & Mount, 1993). The participants were primarily male, college graduates, and middle-aged. In all cases, managers were responsible for closely supervising other civilians in day-to-day operations in U.S. Army installations located across the country. Their interactions with others were primarily characterized by activities associated with leading, directing, and coaching subordinates, rather than working collaboratively.

Sample 7. As part of a larger study (Barrick & Mount, 1996), we collected complete data on 256 truck drivers in two long-haul transportation firms. The typical participant was male, was in his late 20s or early 30s, and had a high school education. Their primary duty was to drive cross-country to deliver products. They worked alone or in dyads and had relatively little interaction with others.

Measures

Job performance. In Samples 1 and 2, we used 10 items to assess job performance (e.g., Sample 1: "[employee name] consistently produces the right quantity or volume of work," Sample 2: "[employee name] takes the initiative to do what is needed without having to be told"). We developed these items on the basis of job analyses performed in both organizations. Supervisory ratings were made on a 5-point scale ranging from 1 (*weak or bottom 10%*) to 5 (*best or top 10%*). In Samples 3 through 7, between 8 and 11 aspects of job performance were developed, which were also based on a job analysis of each job. The dimensions were quality of work, quantity of work, initiative, customer communications, planning, organizational commitment, job knowledge, allocation, interpersonal orientation, self-development, and account management. Supervisory ratings were made on a 5-point scale ranging from 1 (*somewhat below*) to 5 (*consistently exceeds job requirements*). All items were summed to yield a total performance score.

Personality. The 120-item Personal Characteristics Inventory (Mount & Barrick, 1995) assessed the FFM personality constructs. The workers rated each item on a 3-point Likert-type scale (1 = *disagree*, 3 = *agree*). Evidence has demonstrated its convergent validity and divergent validity with other FFM measures (Mount, Barrick, Laffitte, & Callans, 1999).

Analyses

First, we entered scores for conscientiousness and agreeableness to control for their main effects.¹ Then, we entered the Conscientiousness \times Agreeableness cross-product term to test the hypothesis.

Results

We present descriptive statistics and reliability estimates in Table 1 and the intercorrelation matrices in Table 2. Conscientiousness ($\bar{r} = .22$, sum of $N = 1,738$ across all seven samples) scores were significantly related to job performance scores in all samples (r s ranged from .16 to .28). The mean observed correlation between agreeableness and supervisory ratings of performance for the five samples (1–5) whose jobs appeared to require substantial cooperative interaction was .15. In contrast, the sample-size weighted, mean correlation for the two samples whose jobs did not require cooperative interaction was .00.

Table 3 presents results of the regression analyses. In support of the hypothesis, the addition of the Conscientiousness \times Agreeableness cross-product term at the second step was significant in the explanation of job performance in the first five samples. It did not add incremental variance in the U.S. Army civilian manager or truck driver samples (Samples 6 and 7). The effect sizes (ΔR^2) in Samples 1, 2, 3, 4, and 5 were within the range of .01 to .03 for moderator effects typically reported in nonexperimental studies (Champoux & Peters, 1987).

To identify the forms of the interactions, we plotted the explanation of job performance scores at the mean as well as at high and low levels of agreeableness for each of the samples (1.0 and -1.0 standard deviations from the mean; Stone & Hollenbeck, 1989). Consistent with expectations, the conscientiousness–job performance relationships were stronger among workers around the mean or at high levels of agreeableness than among workers low in agreeableness. As an example of the form of the interactions, we present Figure 1. It reveals that the Sample 1 workers high in both conscientiousness and agreeableness received the highest ratings of job performance. Specifically, agreeableness had at least a small effect on performance among workers with conscientiousness scores at or above 2.69 ($z = .11$). Among the highly conscientious workers, those who were low in agreeableness received lower ratings of job performance than those high in agreeableness. Finally, for low-conscientious workers, agreeableness was unrelated to ratings of performance.

Discussion

This is the first published study of which we are aware to examine the effects of interactions among personality dimensions on success at work. Consistent with the notion that highly conscientious workers without interpersonal sensitivity may be ineffective, we found that among highly conscientious workers, those high in agreeableness received higher ratings of job performance than those low in agreeableness across the majority of the samples. Perhaps because highly conscientious workers tend to hold others to their own performance and motivational standards and because they prefer personal responsibility, they may perform ineffectively when also uncooperative and inconsiderate of others.

¹ Recognizing that general mental ability (GMA) has been shown to be a nontrivial predictor of performance (e.g., Hunter, 1983), we included GMA as a control variable in the regression analyses for the samples in which it was available—Samples 1, 2, 4, and 5. Because the inclusion of GMA had no appreciable effects on the results and because we did not measure GMA in three of the samples, we did not report those results here.

Table 1
Means, Standard Deviations, and Reliability Estimates

Sample	Job performance	Conscientiousness	Agreeableness	Interaction
Sample 1				
<i>M</i>	3.28	2.79	2.63	7.14
<i>SD</i>	0.82	0.19	0.27	1.01
Reliability estimate	0.87	0.78	0.79	
Sample 2				
<i>M</i>	3.13	2.66	2.65	7.08
<i>SD</i>	0.75	0.23	0.31	1.20
Reliability estimate	0.91	0.74	0.77	
Sample 3				
<i>M</i>	1.65	2.60	2.57	6.68
<i>SD</i>	0.70	0.23	0.23	0.87
Reliability estimate	0.78	0.84	0.71	
Sample 4				
<i>M</i>	3.40	2.59	2.49	6.49
<i>SD</i>	0.86	0.29	0.36	1.36
Reliability estimate	0.84	0.86	0.80	
Sample 5				
<i>M</i>	3.50	2.62	2.51	6.62
<i>SD</i>	0.84	0.29	0.35	1.36
Reliability estimate	0.80	0.87	0.82	
Sample 6				
<i>M</i>	81.56	2.48	2.49	6.20
<i>SD</i>	13.59	0.32	0.31	1.17
Reliability estimate	0.88	0.89	0.67	
Sample 7				
<i>M</i>	2.28	2.65	2.51	6.69
<i>SD</i>	0.65	0.28	0.37	1.32
Reliability estimate	0.79	0.87	0.82	

Note. The reliability estimates are alphas.

Even more noteworthy is the finding that supervisors viewed conscientious workers with low levels of agreeableness as performing at lower levels than conscientious workers with high levels of agreeableness. This finding suggests caution in relying on bivariate personality–performance research to support employee selection decisions. Therefore, we advocate that personality researchers begin to consider an interactive profile approach when analyzing the FFM and its influence on employee work outcomes.

Confidence in our contribution stems from two strengths of this study. First, we found a consistent conscientiousness–agreeableness interaction across five different samples, providing

some evidence of replication as advocated by Golding (1975). Second, our measures of job performance were based on job analyses and thus were organizationally relevant.

However, the hypothesized interaction was not found in all samples. One explanation for this finding is that the posited interaction may be influenced by the characteristics of the job. There are certain jobs in which substantial interaction with others and cooperation are critical for success at work. In other jobs, there is little need for social dealings, or the nature of the interactions with others is not primarily cooperative. Careful examination of our samples indicated that the first five jobs (interdependent clerical

Table 2
Intercorrelation Matrices

Variable	Sample 1/2				Sample 3/4				Sample 5/6				Sample 7			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Job performance	—	.16**	.12*	.17*	—	.16**	.28**	.28**	—	.24**	.01	.17*	—			
2. Conscientiousness	.28**	—	.44**	.79**	.24**	—	.40**	.78**	.17**	—	.17*	.78*	.27**	—		
3. Agreeableness	.06	.38**	—	.89**	.05	.07	—	.88**	.28**	.37**	—	.74*	.00	.40**	—	
4. Interaction	.18**	.74**	.89**	—	.20**	.73**	.73**	—	.28**	.77**	.87**	—	.14*	.78**	.88**	—

Note. Correlations between the conscientiousness–agreeableness interaction measure and all other variables have not been reported before. Zero-order correlations were previously reported in Mount et al. (1998; Samples 4 and 5), Barrick and Mount (1993; Sample 6), and Barrick and Mount (1996; Sample 7). For Sample 1/2, the correlations for Sample 1 are below the diagonal, and the correlations for Sample 2 are above the diagonal. For Sample 3/4, the correlations for Sample 3 are below the diagonal, and the correlations for Sample 4 are above the diagonal. For Sample 5/6, the correlations for Sample 5 are below the diagonal, and the correlations for Sample 6 are above the diagonal.

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

Table 3
Multiple Regression Results

Predictor	β						
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7
Step 1							
Conscientiousness	-0.72	-0.88†	-1.01	-0.81*	-0.46	0.41	0.05
Agreeableness	-1.59*	-1.31*	-1.20	-0.87*	-0.47	0.13	-0.50
R^2	.08**	.03*	.06*	.08*	.07*	.06*	.09*
Adjusted R^2	.08**	.02*	.05*	.07*	.06*	.04*	.08*
Step 2							
Cross-product	2.14*	2.04*	1.82*	1.69*	1.04*	-0.25	0.54
R^2	.09**	.05**	.07*	.11*	.08*	.06*	.09*
Adjusted R^2	.09**	.04**	.06*	.09*	.07*	.04*	.08*
ΔR^2	.01*	.02*	.01*	.02*	.01*	.00	.00

Note. The standardized betas presented are those derived at the second step.

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

workers, sales representatives with long-term customer relations, and production workers whose work was organized into teams) can be characterized as having substantial social interaction requiring cooperation and collaboration. Consistent with this reasoning, significant conscientiousness–agreeableness interactions were found in all five of these samples. Although not definitive, these results suggest that disagreeable people are likely to be particularly ineffective in such work contexts. In contrast, the present findings suggest that the conscientiousness–agreeableness interaction is likely to have less of an impact on performance when frequent interaction with others is not an important part of the job (e.g., cross-country truck drivers) or when the nature of the interactions is characterized by leading, supervising, delegating to, and coaching others (as with managers). Indeed, research suggests that the

best managers tend to be low in the need to be liked and accepted by others (Boyatzis, 1984). It might, therefore, be useful for future researchers to examine the importance of interpersonal relations (particularly when cooperation and collaboration are required) in the interaction between conscientiousness and agreeableness in work settings.

Implications for Practice

Although evidence suggests that conscientiousness is the construct in the FFM that most consistently predicts job performance (e.g., Barrick et al., in press), the present results suggest that selection criteria should also consider the relevance of agreeableness among workers who are high in conscientiousness. High levels of agreeableness appear to give conscientious workers the boost necessary to be effective in the workplace, particularly when interaction or joint collaboration is necessary. More important, low levels of agreeableness canceled the positive effect of conscientiousness on job performance. Consequently, staffing specialists using only conscientiousness, and thus hiring candidates high in conscientiousness, may actually be inhibiting organizational effectiveness when hiring those who are also low in agreeableness.

As organizations become more organic and flexible, which is likely to promote “weaker situations” (Mischel, 1977), the influence of employees’ personalities on organizational outcomes is likely to become even more pronounced. Therefore, research efforts to identify interactions that predict preferred work behaviors might have increasing utility.

Directions for Future Research

We suggest three areas for possible future research. First, further replication is needed to determine how the findings reported here correspond to the results of studies conducted in other work environments. In particular, we believe that the degree of cooperative interaction required to perform a job is an important variable that affects the Conscientiousness \times Agreeableness interaction. Research that investigates the boundary conditions of this variable would be helpful. Second, efforts that directly assess social skill by using construct valid measures may provide a more robust test of

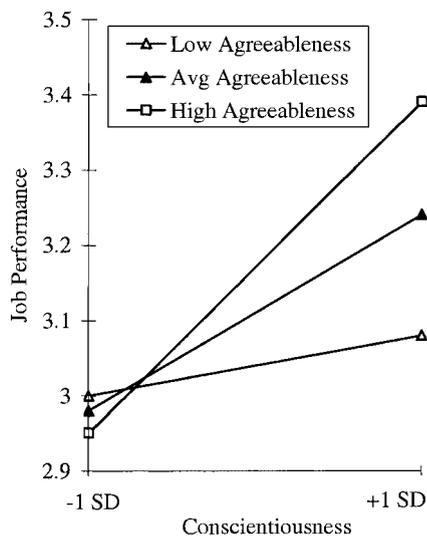


Figure 1. Job performance regressed on conscientiousness scores: low-, average- (avg), and high-agreeableness groups from Sample 1. $Y = (-2.82 - 1.72f)X + (-3.18f + 10.06)$. Low score equals one standard deviation below the mean; high score equals one standard deviation above the mean. Only scores plus or minus one standard deviation from the mean of conscientiousness scores are plotted.

our argument. Third, researchers may find it useful to examine the interactive effects of FFM variables on other work outcomes, such as merit increases, career progression, and turnover. These results suggest that researchers might find it helpful to consider the full constellation of personality characteristics to enhance psychological theory and practice.

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