

RESEARCH REPORT

Taking It to Another Level: Do Personality-Based Human Capital Resources Matter to Firm Performance?

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Drawing on the attraction-selection-attrition perspective, strategic human resource management (SHRM) scholarship, and recent human capital research, this study explores organization-level emergence of personality (i.e., personality-based human capital resources) and its direct, interactive, and (conditional) indirect effects on organization-level outcomes based on data from 6,709 managers across 71 firms. Results indicate that organization-level mean emotional stability, extraversion, and conscientiousness are positively related to organization-level managerial job satisfaction and labor productivity but not to financial performance. Furthermore, organization-level mean and variance in emotional stability interact to predict all three organization-level outcomes, and organization-level mean and variance in extraversion interact to predict firm financial performance. Specifically, the positive effects of organization-level mean emotional stability and extraversion are stronger when organization-level variance in these traits is lower. Finally, organization-level mean emotional stability, extraversion, and conscientiousness are all positively related to firm financial performance indirectly via labor productivity, and the indirect effects are more positive when organization-level variance in those personality traits is lower. Overall, the findings suggest that personality-based human capital resources demonstrate tangible effects on organization-level outcomes. Theoretical and practical implications of these findings are discussed along with study limitations and future research directions.

Keywords: personality, performance, human capital resources, attraction-selection-attrition

Emerging research on human capital resources is starting to shed light on how individual differences in knowledge, skills, abilities, and other characteristics (KSAOs) contribute to unit and

organizational performance beyond their influence on individual performance (Ployhart, Weekley, & Ramsey, 2009; Ployhart, Van Iddekinge, & MacKenzie, 2011; Van Iddekinge et al., 2009). Individual differences in KSAOs are thought to influence organizational performance through the emergence of human capital resources, which are defined as the aggregate KSAOs of an organization's workforce that have the potential to contribute to organizational performance (Ployhart, Nyberg, Reilly, & Maltarich, 2014; Van Iddekinge et al., 2009). Given that personality influences how people think, feel, and behave (Costa & McCrae, 1992), personality represents one potentially important microfoundation of human capital resources (Ployhart, 2012).

The attraction-selection-attrition (ASA) model (Schneider, 1987) suggests that personality-based human capital resources are particularly valuable if they are based on managers, because managers implement human resource (HR) practices and have the opportunity to directly influence collective processes (e.g., climate, coordination), which, in turn, influence unit and organizational performance (Giberson, Resick, & Dickson, 2005; Schneider, Goldstein, & Smith, 1995). Furthermore, resource-based theory of the firm (RBT) notes the importance of managerial action as a valuable resource that is unevenly distributed across an organization (Barney, 1991; Chadwick, Super, & Kwon, 2015).

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Thus, the integration of the ASA and RBT perspectives suggests that the aggregate personality of an organization's managers is valuable yet heterogeneously distributed across organizations, which may help explain why some organizations outperform others (Barney, 1991; Barney & Wright, 1998; Ployhart et al., 2009).

Although research suggests that personality can predict job performance at the individual level (Barrick, Mount, & Judge, 2001), this does not mean that a personality-performance relationship exists at the organizational level or that the magnitude of this relationship is the same (Narayan & Ployhart, 2013; Ployhart, 2012). So far, the personality-performance relationship at the organizational level has been inferred from individual-level evidence via utility analysis (Schmidt & Hunter, 1998). Specifically, utility analysis attempts to estimate the financial value of a selection tool based on individual-level validity, thereby possibly making a "bottom up" inferential leap (Schneider, Smith, & Sipe, 2000). Although a few studies have examined the relationship between personality and performance at the "unit" level (Barrick, Stewart, Neubert, & Mount, 1998; Hofmann & Jones, 2005), these studies do not shed light on *interfirm* heterogeneity due to their reliance on *intrafirm* (i.e., unit-level) data. As noted by Ployhart and Schneider (2005), "this leaves the entire selection profession in the undesirable position of having to assume these relationships exist" at the organizational level (p. 513). Relatedly, because of interactions and dependencies in the work process, organization performance may not reflect a simple sum of individual or unit performance (Ostroff, 1992). This highlights the importance of *directly* measuring organizational performance when evaluating the personality-performance link at the organizational level. Furthermore, if personality predicts objective, firm-level outcomes such as financial performance (e.g., instead of subjective supervisory ratings of performance), this may provide practitioners with better evidence to convince organizational decision makers of the value of personality as a selection tool (Ployhart & Schneider, 2012).

The current study was conducted to address this key gap in the literature by directly investigating the relationship between organization-level emergence of personality (i.e., personality-based human capital resources) and firm internal (operational) and external (financial) performance. We also examine whether organization-level emergence of personality leads to external performance through internal performance, as has been found with education and experience-based human capital resources (Crook Todd, Combs, Woehr, & Ketchen, 2011). Addressing these questions contributes to theory and practice by elucidating the process through which organization-level emergence of personality may lead to firm performance and demonstrating the *operational and financial* value of personality instead of relying on the *potential* value of personality based on results of individual-level research. The present study also addresses recent calls for more research that builds bridges between micro- and macro-level HR research (e.g., psychological microfoundations of firm performance) and between academics and practitioners (e.g., direct assessment of the value of organization-level emergence of personality; Molloy, Ployhart, & Wright, 2011; Ployhart & Moliterno, 2011; Ryan & Ployhart, 2014; Wright & Boswell, 2002).

Attraction-Selection-Attrition and Organizational Emergence of Personality

The ASA model posits that organizations tend to recruit, select, and retain individuals (in particular, managers) whose personality fits the "personality" of the organization (Schneider, 1987). Therefore, organizational personality profiles are not formed randomly and spontaneously, but represent the personal characteristics of organizational leaders and managers who transmit their personality into their organizations through the goals and climates they establish and the individuals they attract, select, and retain (Giberson et al., 2005). Over time, the ASA process leads to a phenomenon whereby the personality profile within an organization becomes rather homogenous and distinct from the personality profiles of other organizations (Ployhart, Weekley, & Baughman, 2006; Satterwhite, Fleenor, Braddy, Feldman, & Hoopes 2009; Schneider, Smith, Taylor, & Fleenor, 1998). The ASA process thus serves as a critical foundation for the emergence of individual personality to the organizational level (Ployhart et al., 2006). Furthermore, when this perspective is integrated with the RBT, it is theorized that personality-based human capital resources are valuable yet heterogeneous across firms, and therefore have the potential to create interfirm differences in performance (Barney, 1991; Ployhart et al., 2009).

From a multilevel perspective, organization-level emergence of personality can be conceptualized in terms of both composition and compilation models (Kozlowski & Klein, 2000; Moynihan & Peterson, 2004). The *composition* model assumes that the similarity among individuals (e.g., in terms of personality) reflects a higher-level phenomenon, which can be represented by the group-level mean (Kozlowski & Klein, 2000; Morgeson & Hofmann, 1999). In contrast, the *compilation* model assumes that differences (diversity) among individuals reflect a higher-level phenomenon, which can be represented by the variance around the group-level mean (Kozlowski & Klein, 2000). Ployhart et al. (2006) noted that "In the multilevel ASA theory, the two constructs of composition and compilation models are theoretically and empirically unique" (p. 664). Thus, we operationalize organization-level emergence of personality using both organization-level mean and variance.

Linking Organizational Emergence of Personality to Firm-Level Outcomes

Organization-level emergence of personality has its origins in the similarities and differences of personality traits among individuals who compose the organization (Morgeson & Hofmann, 1999; Narayan & Ployhart, 2013; Ployhart, 2012). We examine the five-factor model (FFM) of personality traits because the FFM has been widely examined at individual and collective levels and hence serves as a reasonable personality trait framework for the present study (Barrick & Mount, 1991; Bell, 2007; Judge, Heller, & Mount, 2002). Although we mainly focus on emotional stability, extraversion, and conscientiousness, we also report results involving the other two FFM traits (agreeableness, openness) for the readers' information. Furthermore, although we build from relevant theories, we do not advance specific hypotheses. Instead, we pose broader research questions given the paucity of theory and prior research on the structure and function of organization-level personality emergence.

Direct Effects of Organization-Level Emergence of Personality

Given the lack of research on organizational-level emergence of personality, we sometimes refer to unit (team or group) personality research (Bell, 2007; Peeters, Van Tuijl, Rutte, & Reymen, 2006; Prewett, Walvoord, Stilson, Rossi, & Brannick, 2009). However, we do not assume that team- and organization-level emergence of personality have exactly the same emergent structure or function. Yet, we believe that, as *interpersonal* phenomena, team- and organizational-level personality may be more similar to each other than to individual-level personality, which is an *intrapersonal* phenomenon (Hofmann & Jones, 2005). Furthermore, our multiorganization managerial sample could be described as a group (team) of managers within each organization because managers frequently communicate, coordinate, and cooperate with one another to achieve common goals.

As suggested in team personality research, the performance of organizations that have emotionally stable managers is enhanced because such managers generate and maintain a relaxed atmosphere that facilitates cooperation (Bell, 2007). In addition, research on top management team (TMT) personality suggests that organizations with more emotionally stable managers can deal with conflicts and adversarial events more effectively and stay focused on the task itself due to their managers' composure (Colbert, Barrick, & Bradley, 2014; Peeters et al., 2006). Small group research suggests that organizations with more extraverted managers, by frequently displaying positive emotions, tend to generate more positive collective emotions (defined as the aggregate moods of the individual members) through emotional contagion (George, 1990; Kelly & Barsade, 2001). These increased positive emotions, in turn, are thought to enhance collective processes such as coordination, effort expenditure, and task strategies among employees (Sy, Côté, & Saavedra, 2005). Research on TMT personality suggests that "because TMTs (and managers) are responsible for communicating a strategic direction for the organization and influencing all their subordinates to coordinate their efforts in support of that direction, the communication and influence skills in teams with high mean levels of extraversion may be associated with higher levels of effectiveness" (Colbert et al., 2014, p. 360; parentheses added). In a similar vein, research on team personality indicates that organizations with high mean levels of extraversion tend to foster a climate of freedom of expression, which is deemed crucial for the effectiveness of collective decision making by helping to avoid groupthink (Peeters et al., 2006). Finally, organizations with more conscientious managers are thought to define performance goals, roles, and responsibilities clearly and have a strong performance-oriented climate, all of which can reduce social loafing and motivate employees to accomplish assigned goals (Colbert et al., 2014; Colbert & Witt, 2009). In sum, we suggest when organizations contain managers who possess a high (mean) level of emotional stability, extraversion, and conscientiousness, employees will be motivated to work harder toward the achievement of collective goals, thereby resulting in higher levels of productivity and profitability.

Interactive Effects of Organization-Level Emergence of Personality

In addition to differences in mean levels of personality, organizations can also differ in terms of the *variance* in personality among managers. We expect that when organization-level variance in these

FFM traits is lower, the positive relations between organization-level mean personality and workforce productivity will be stronger (Ployhart et al., 2006). This is because, in organizations in which most managers possess a high level of emotional stability, extraversion, and conscientiousness (i.e., high mean and low variance in these FFM traits), employees receive clearer and stronger signals about work-related goals and experience more positive emotions due to emotional contagion, thus resulting in higher levels of labor productivity and performance (George, 1990; Sy et al., 2005). In addition, the similarity-attraction hypothesis (Byrne, 1971) and social identity theory (Reynolds, Turner, & Haslam, 2003) would predict that managers in such organizations experience higher levels of job satisfaction. For example, managers who possess similar personality traits "tend to share common aspects of cognitive processing and common methods of interpreting events that help them reduce uncertainty, stimulus overload, ambiguity, conflict, and other negative features of work interaction" (Ostroff, Shin, & Kinicki, 2005, p. 599), thus increasing their satisfaction with the group (Meglino & Ravlin, 1998). In contrast, in organizations in which many managers possess high levels of these traits, but some managers possess lower levels (i.e., mean is still high but variance is higher), conflicts and coordination problems among managers occur more frequently due to differences in how to view and solve problems, thereby causing managerial inefficiency and dissatisfaction. In such organizations, employees likely receive less consistent signals about work-related goals and experience less positive emotions, thus reducing workforce productivity and firm performance (Colbert et al., 2014; Kelly & Barsade, 2001). Therefore, we expect that organization-level mean and variance in personality will interact to predict firm labor productivity, financial performance, and managerial job satisfaction, such that the positive relationships between organization-level mean personality and these outcomes will be stronger when organization-level variance in personality is low and weaker when organizational-level variance in personality is high.

(Conditional) Indirect Effects of Organization-Level Emergence of Personality

Previous research has found that organizations with more satisfied employees tend to be more productive and profitable (Ostroff, 1992). Other studies have found that organizations with more affectively committed managers tend to perform better because those managers represent "a valuable, relatively rare, and firm-specific resource that is difficult for competitors to copy" (Gong, Law, Chang, & Xin, 2009, p. 265). Given the commonality between job satisfaction and affective commitment (Harrison, Newman, & Roth, 2006; Ostroff, 1992), as well as the aforementioned link between personality and job satisfaction, we believe that organization-level managerial job satisfaction may serve as a mediator that connects a more distal, personality-based human capital resource to workforce productivity (Ployhart, 2012). Specifically, we expect that organization-level mean personality will influence labor productivity via managerial job satisfaction. Furthermore, we predict that the indirect effect will be stronger when organizational-level variance in personality is lower because, as discussed above, lower organization-level variance in personality is expected to strengthen the effects of organization-level mean personality. Finally, human capital resources are thought to relate to firm financial performance through their influence on operational performance (Crook et al., 2011; Jiang, Lepak, Hu, & Baer, 2012; Ployhart & Hale, 2014). Thus, we also

expect that organization-level mean personality will affect firm financial performance via workforce productivity and that the indirect effect will be stronger when organizational-level variance in personality is lower.

Firm-Level Validities of Broad Versus Narrow Personality Traits

We also explore the question of whether broad and narrow personality-based human capital resources (i.e., organization-level mean and variance in personality) are differentially predictive of firm-level outcomes at the organization level of analysis. Broad FFM factors may be less firm-specific because they are easier to imitate by competitors than narrow FFM facets (Barney, 1991; Crook et al., 2011). To the extent that this is true, we expect that narrow personality-based human capital resources might be more strongly related to firm-level outcomes than broad personality-based human capital resources. In addition, we expect that personality-based human capital resources will be more strongly related to firm-level managerial job satisfaction and operational (internal) performance than to financial (external) performance. This is because compared with financial performance measures, operational performance measures “are closer to the actual competitive advantages created by superior human capital” (Crook et al., 2011, p. 446) and are less affected by uncertain environmental factors (Kim & Ployhart, 2014).

Method

Data and Sample

The sample included 71 South Korean firms from various industries that sent at least 20 managers ($M = 94.49$; $SD = 53.48$) to a team-building training program led by an HR consulting firm: 29 organizations in the manufacturing industry, 14 in sales/services, 12 in finance/banking, 11 in information technology, and 5 in other industries. Following Schneider et al. (1998), we set the minimum number of participants per firm to 20. As part of the training program, all participants ($N = 6,709$) completed a personality questionnaire including a single item of overall job satisfaction. Most participants were male (76%) and had an average organizational tenure of 6.50 years ($SD = 3.70$). Personality and job satisfaction data were collected in 2006 and early 2007, and firm performance data for 2007 and 2008 were obtained from an archival database.

Measures

Personality. We used the official (back-translated) Korean version of the NEO Personality Inventory-Revised (NEO-PI-R; Min, Lee, & Jeong, 1997), which contains six facet scales (eight items per scale) for each FFM factor. Participants responded to each item on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Consistent with Ployhart et al. (2006), the means and SD s of scores on each personality trait were computed for each organization to operationalize organization-level mean and variance in personality. The NEO-PI-R is one of the most established and widely used measures of the FFM. Nonetheless, given that the NEO-PI-R has not been widely used to measure organizational-

level personality, we conducted confirmatory factor analyses (with the facet scores as indicators of their corresponding FFM factors) to assess the fit of this model to the data. Fit indices for the FFM at the (a) individual and (b) organizational levels were: (a) $\chi^2 = 1189.31$, $df = 395$, Comparative Fit Index (CFI) = .72; Tucker-Lewis Index (TLI) = .70; root mean square error of approximation (RMSEA) = .168; standardized root mean square residual (SRMR) = .143 and (b) $\chi^2 = 16,380.91$, $df = 395$, CFI = .70; TLI = .66; RMSEA = .113; SRMR = .117.¹ Alpha coefficients were acceptable at both levels as shown in Table 1.

Job satisfaction. Job satisfaction was measured on a 100-point scale (1 = *rarely satisfied* to 100 = *fully satisfied*). Meta-analytic evidence shows that a single-item measure of job satisfaction is strongly (around .70) correlated with longer measures of job satisfaction (Wanous, Reichers, & Hudy, 1997). When this score was aggregated to the organization level, the intraclass correlation coefficient (ICC) (1) was estimated to be .20 [ICC(2) = .930], which provides empirical support for organization-level aggregation (Bliese, 2000; James, 1982).

Firm performance. Consistent with previous research (Kim & Ployhart, 2014; Kwon, Chung, Roh, Chadwick, & Lawler, 2012), we obtained internal and external firm performance data for 2007 and 2008 from the Korea Information Service (KIS). Internal performance was operationalized by labor productivity, which is a ratio of firm operation revenue (output) to the total number of employees (input; Datta, Guthrie, & Wright, 2005). We operationalized external firm performance by return on equity (ROE; Campbell, Saxton, & Banerjee, 2014). We used 2008 performance data for the outcomes and 2007 performance data for the controls.

Controls. Consistent with prior research (Kim & Ployhart, 2014), we controlled for firm size (1 = small [less than 300 employees], 2 = medium [between 300 and 1,000 employees], and 3 = large [over 1,000 employees]) and industry in models predicting internal performance. In models predicting firm external performance, we further controlled for past financial performance because “ignoring past performance may lead to inaccurate estimates” (Kim & Ployhart, 2014, p. 368; see also Wright, Gardner, Moynihan, & Allen, 2005). We used the same three controls in predicting organization-level managerial job satisfaction. As sensitivity analyses, we ran all analyses with and without controls (Becker, 2005; Carlson & Wu, 2012; Spector & Brannick, 2011). The two sets of results were very similar, and we focus our results and conclusions on analyses with the controls to facilitate comparisons with prior research. Furthermore, consistent with Kim and Ployhart (2014), we modeled between-industry differences by allowing the intercept to vary across industries using random-intercept mixed-effect modeling. To test for indirect effects, we used PROCESS methods described by Hayes (2013). Finally, all variables were standardized to facilitate comparison of coefficients

¹ The lack of stronger fit may have been due to strong correlations among some FFM traits (in particular, emotional stability and conscientiousness) often found in managerial samples (see also Dilchert & Ones, 2008) and/or to our use of facet-level scores as indicators instead of item-level scores (which were unavailable to us). The FFM intercorrelations (ranging from .11 to .63) we found among managers are indeed slightly higher than corresponding normative correlations (ranging from -.02 to .53) reported in the NEO-PI-R manual (Costa & McCrae, 1992).

Table 1
Descriptive Statistics and Correlations for Study Variables

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Firm size	2.31	.75	1.00															
2. ES_mean	164.25	8.60	.16	1.00														
3. E_mean	173.50	8.10	-.01	.80	1.00													
4. C_mean	180.82	7.33	.08	.89	.81	1.00												
5. A_mean	167.53	4.02	.03	.63	.65	.62	1.00											
6. O_mean	156.56	4.80	.03	.22	.41	.22	.12	1.00										
7. ES_SD	18.36	3.48	.11	-.29	-.16	-.22	-.05	.20	1.00									
8. E_SD	17.91	3.18	.04	-.34	-.28	-.27	-.21	-.04	.40	1.00								
9. C_SD	16.75	2.97	-.09	-.26	-.20	-.25	.00	.15	.59	.32	1.00							
10. A_SD	12.80	1.74	-.04	-.03	.07	-.13	-.04	.16	.34	.18	.35	1.00						
11. O_SD	14.98	1.98	.28	-.04	-.08	-.03	-.09	-.03	.30	.32	.20	.15	1.00					
12. Managerial job satisfaction	79.07	5.51	.05	.33	.32	.39	.34	.05	-.34	-.33	-.29	-.13	-.13	1.00				
13. 2007 Labor productivity	20,490	18,981	.03	.27	.35	.31	.30	.08	-.15	-.29	-.08	.06	-.02	.30	1.00			
14. 2008 Labor productivity	23,724	20,554	-.01	.20	.28	.26	.25	-.11	-.19	-.26	-.10	.08	.01	.27	.88	1.00		
15. 2007 ROE	6.96	7.00	-.05	-.08	-.10	-.08	-.18	-.13	-.29	-.03	-.08	.05	-.14	.08	.46	.60	1.00	
16. 2008 ROE	24.66	81.07	-.06	.11	.17	.13	.05	-.04	-.21	-.19	-.06	.21	.02	.19	.62	.67	.41	1.00

Note. $N = 71$ for all the variables except for managerial job satisfaction ($N = 70$). ES = Emotional Stability ($\alpha_{\text{firm-level}} = .95/\alpha_{\text{individual-level}} = .87$); E = Extraversion (.93/.86); C = Conscientiousness (.95/.85); A = Agreeableness (.75/.68); O = Openness to Experience (.79/.69); SD = standard deviation; ROE = return on equity; firm size codes (1 = small, 2 = medium, 3 = large). Organization-level correlations are below the diagonal; correlations equal to or greater than .20 do not include zero in its 90% confidence interval ($p < .05$). Individual-level correlations are above the diagonal ($N = 6,709$); all reported correlations are statistically significant ($p < .05$).

and to more easily interpret potential interaction effects (Dawson & Richter, 2006).

Results

In addition to theoretical justification, researchers (Bliese, 2000; LeBreton & Senter, 2007) have suggested that a high ICC(1) is required for an individual-level variable to be considered as a higher-level, emergent variable through aggregation. The ICC(1) values for Emotional Stability (.179), Extraversion (.251), and Conscientiousness (.182) were relatively high. The ICC(1) values for Openness to Experience (.066) and Agreeableness (.107) were relatively low. The ICC(2) values for Emotional Stability (.954), Extraversion (.969), and Conscientiousness (.955) indicate that the organization-level variables were highly reliable. The ICC(2) values for Openness to Experience (.870) and Agreeableness (.919) were also quite high. Results of multivariate analysis of variance and discriminant function analyses that included organizational membership as a dependent variable also supported cross-organization differences for emotional stability, extraversion, and conscientiousness (Wilks' $\lambda = .65$, $F = 14.49$, $p < .05$). Furthermore, the sum of squares of canonical correlations of the three FFM traits, which indicates how successfully these traits discriminate among organizations in the sample, was sufficient at .37 (Schneider et al., 1998). These results provided strong support for conceptualizing personality at the organization level and allowed us to proceed to test our research questions.

Direct Effects of Organization-Level Emergence of Personality

The results in Table 1 provide support for our expectation that organization-level mean Emotional Stability, Extraversion, and Conscientiousness would relate positively to organization-level outcomes. Specifically, all three variables were significantly re-

lated (i.e., the 90% confidence intervals did not include zero) to both organization-level managerial job satisfaction ($r_s = .32$ to $.39$) and to firm labor productivity ($r_s = .20$ to $.28$). In contrast, none of the personality variables were related significantly to financial performance ($r_s = .11$ to $.17$). Also, agreeableness was significantly and positively related to managerial job satisfaction and labor productivity, but not to financial performance, whereas openness was not significantly related to any firm-level outcome. Mixed-effect modeling results in Tables 2, 3, and 4 showed the same patterns of results except for the relationship between emotional stability and labor productivity (see Table 3).

We also explored the combined influence of the three FFM traits. The omnibus results (i.e., the results when all the relevant terms are in the same model) are reported in Model 1 of Appendix. However, caution should be exercised in interpreting these results (particularly as relative importance indices) given the strong intercorrelations among the three FFM traits (at the organizational level) and the low level of statistical power (given the current study's small sample size) to detect individual effects within this complex model. For these reasons, we did not use these analyses to test our research questions, but present them in Appendix for informational purposes.

Interactive Effects of Organization-Level Emergence of Personality

We expected that the positive relations between organization-level mean personality and the outcomes would be stronger when organization-level variance (operationalized using SD) in these traits is low and weaker when organizational-level variance is high. Such "Mean \times SD" interaction effects were significant for emotional stability in predicting organization-level managerial job satisfaction ($b = -.31$, $SE = .16$; see Table 2 and Figure 1a), labor productivity ($b = -.30$, $SE = .17$; Table 3 and Figure 1b), and financial performance ($b = -.36$, $SE = .15$; see Table 4 and

Table 2

Random-Intercept Mixed-Effect Models Predicting Organization-Level Managerial Job Satisfaction

Predictor	Emotional Stability				Extraversion				Conscientiousness				Agreeableness				Openness to Experience				
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	
Intercept	−.08	.11	−.14	.35	.03	.16	−.20	.36	.02	.14	−.03	.36	−.01	.19	−.10	.37	−.01	.13	−.30	.39	
Firm-level controls																					
Firm size				.02	.15			.10	.14			.02	.14			.04	.14			.13	.16
2007 ROE				−.01	.11			.07	.11			.07	.11			.11	.11			.03	.13
Predictors																					
Mean	.22*	.11	.21*	.12	.28*	.11	.28*	.11	.36*	.12	.36*	.12	.40*	.11	.41*	.11	.06	.12	.06	.12	
SD	−.34*	.12	−.34*	.12	−.25*	.11	−.24*	.11	−.17	.12	−.17	.12	−.11	.11	−.11	.11	−.13	.12	−.15	.12	
Interaction																					
Mean × SD	−.31*	.15	−.31*	.16	.12	.12	.12	.12	.07	.13	.05	.13	−.21	.15	−.20	.15	.17	.15	.16	.16	

Note. $N = 70$; b = coefficient; SE = standard error; ROE = return on equity; SD = standard deviation.

* The 90% confidence interval does not include zero ($p < .05$).

Figure 1c). Also, there was a significant Mean × SD interaction for Extraversion in predicting financial performance alone ($b = -.33$, $SE = .11$; see Table 4 and Figure 1d). No significant Mean × SD interactions were found for Conscientiousness. We also found significant Mean × SD interaction effects for Openness in predicting labor productivity (see Table 3) and for agreeableness in predicting financial performance (see Table 4). Interestingly, stronger effects were found when organization-level variance in these personality traits was higher. Omnibus analyses including all three FFM traits and their interaction terms simultaneously in the same model showed fewer significant interactions despite similar patterns of results (see Model 2 of Appendix). Again, these results likely were affected by the strong intercorrelations among the three FFM traits (at the organizational level) and the low level of statistical power to detect interaction effects within this complex model.

Indirect Effects of Organization-Level Emergence of Personality

As expected, we found that the (conditional) indirect effects of organization-level mean personality on labor productivity via managerial job satisfaction were significant for all three FFM traits (see the upper panel of Table 5). The indirect effects (.049–.072) were weaker than their direct effects (.130–.217), and the expected

conditional indirect effect (i.e., a more positive indirect effect of mean personality with lower variance in personality) was significant only for emotional stability (.112 for low variance vs. -.021 for high variance). In addition, as expected, the indirect effects of organization-level mean personality on financial performance via firm labor productivity were significant for all three FFM traits (see the lower panel of Table 5). In contrast to the analyses involving managerial job satisfaction, in this case, the indirect effects (ranging from .181 to .186) were stronger than their direct effects (ranging from -.028 to -.010), and the expected conditional indirect effect was significant for all three FFM traits. That is, the indirect effects of organization-level mean Emotional Stability, Extraversion, and Conscientiousness (respectively) were more positive when organization-level variance in personality was low (.309, .326, and .252) than when organizational-level variance was high (.052, .038, and .121). The same pattern of indirect effects was also found for Agreeableness, but not for Openness.

Firm-Level Validity of Broad Versus Narrow Personality-Based Human Capital Resources

We explored whether narrow personality-based human capital resources (i.e., organization-level mean and variance) were more predictive of firm-level outcomes than broad personality-based human capital resources. Table 6 indicates that, in general, relations of

Table 3

Random-Intercept Mixed-Effect Models Predicting Workforce Productivity (2008 Labor Productivity)

Predictor	Emotional Stability				Extraversion				Conscientiousness				Agreeableness				Openness to Experience			
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Intercept	-.08	.12	.08	.37	-.03	.12	-.01	.36	.01	.12	.12	.38	-.01	.11	.08	.37	.01	.11	.03	.37
Firm-level control																				
Firm size			-.07	.16			-.01	.15			-.05	.15			-.04	.15			-.01	.16
Predictors																				
Mean	.12	.12	.13	.12	.22*	.12	.22*	.12	.26*	.13	.26*	.13	.26*	.11	.26*	.11	-.10	.11	-.10	.11
<i>SD</i>	-.22*	.12	-.21*	.12	-.21*	.12	-.21*	.12	-.02	.13	-.03	.13	.06	.12	.06	.12	-.02	.11	-.02	.12
Interaction																				
Mean × <i>SD</i>	-.29*	.16	-.30*	.17	-.11	.12	-.11	.12	.03	.14	.03	.14	-.12	.16	-.13	.16	.42*	.14	.42*	.14

Note. $N = 71$; b = coefficient; SE = standard error; SD = standard deviation.

* The 90% confidence interval does not include zero ($p < .05$).

Table 4

Random-Intercept Mixed-Effect Models Predicting Financial Performance (2008 ROE)

Predictor	Emotional Stability				Extraversion				Conscientiousness				Agreeableness				Openness to Experience			
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Intercept	-.12	.12	.17	.34	-.08	.12	-.01	.32	.00	.12	.11	.35	.00	.11	.04	.33	.00	.12	.19	.36
Firm-level controls																				
Firm size			-.12	.14			-.04	.13			-.06	.14			-.01	.14			-.08	.15
2007 ROE			.36*	.11			.44*	.10			.43*	.11			.44*	.10			.44*	.12
Predictors																				
Mean	.01	.12	.10	.11	.10	.12	.15	.10	.13	.13	.15	.12	.04	.12	.12	.10	-.03	.12	.02	.11
<i>SD</i>	-.30*	.12	-.14	.12	-.21*	.12	-.19*	.10	-.03	.13	-.02	.12	.25*	.12	.25*	.11	.01	.12	.10	.11
Interaction																				
Mean × <i>SD</i>	-.43*	.16	-.36*	.15	-.29*	.12	-.33*	.11	.00	.14	-.09	.13	.22	.16	.27*	.14	-.09	.15	-.09	.15

Note. $N = 71$; b = coefficient; SE = standard error; ROE = return on equity; SD = standard deviation.

* The 90% confidence interval does not include zero ($p < .05$).

organization-level mean and variance of personality with the firm-level outcomes did not vary based on broad versus narrow FFM traits. In five out of the six instances in which there were significant differences between broad and narrow personality resources (e.g., Extraversion vs. its Excitement Seeking facet), the broad personality

resources more predictive of the outcome. Finally, consistent with our expectation, the results further showed that, in general, personality-based human capital resources were more strongly related to job satisfaction, followed by labor productivity and financial performance.

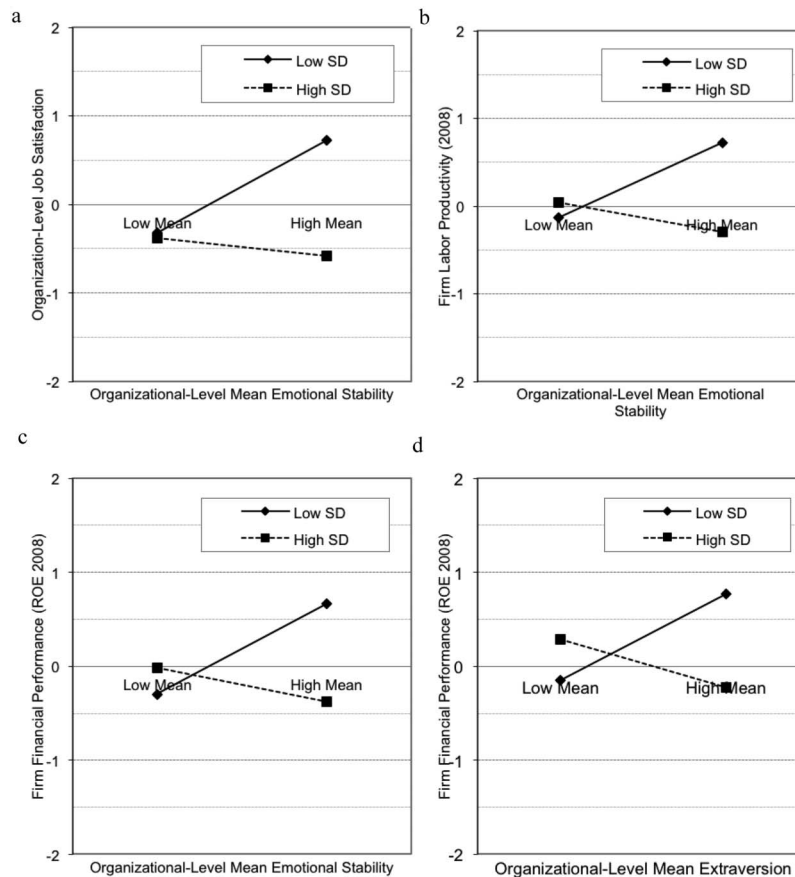


Figure 1. (a) Interaction effect of organization-level mean and variance in emotional stability on organization-level managerial job satisfaction, (b) interaction effect of organization-level mean and variance in emotional stability on firm labor productivity, (c) interaction effect of organization-level mean and variance in emotional stability on financial performance, and (d) interaction effect of organization-level mean and variance in extraversion on financial performance.

Table 5

Indirect Effects of Firm-Level Mean Personality on Labor Productivity (via Managerial Job Satisfaction) and Firm Financial Performance (via Labor Productivity) Contingent Upon the Levels of Firm-Level Variance in Personality

Outcome and mediator	Moderator level ^a	Emotional Stability	Extraversion	Conscientiousness	Agreeableness	Openness to Experience
2008 Labor productivity via managerial job satisfaction	Low _{Mean - 1SD}	Indirect effect	Indirect effect	Indirect effect	Indirect effect	Indirect effect
		.112 ^{*H} (.121 ^{*H})	.023 (.023)	.056 [*] (.056 [*])	.110 [*] (.110 [*])	-.033 (-.031)
	Mean	.049 [*] (.050)	.052 [*] (.051 [*])	.072 [*] (.071 [*])	.074 [*] (.073 [*])	.013 (.014)
	High _{Mean + 1SD}	-.021 ^L (-.021 ^L)	.081 [*] (.080 [*])	.087 (.087)	.038 (.038)	.059 (.058)
		Direct effect	Direct effect	Direct effect	Direct effect	Direct effect
		.130 (.123)	.217 (.218)	.181 (.178)	.179 (.179 [*])	-.125 (-.125)
2008 ROE via 2007 labor productivity 2007	Low _{Mean - 1SD}	Indirect effect	Indirect effect	Indirect effect	Indirect effect	Indirect effect
		.309 ^{*H} (.350 ^{*H})	.326 ^{*H} (.312 ^{*H})	.252 ^{*H} (.206 [*])	.340 ^{*H} (.359 ^{*H})	.036 (-.113 ^{*L})
	Mean	.181 [*] (.138 [*])	.182 [*] (.173 [*])	.186 [*] (.200 [*])	.251 [*] (.217 [*])	.079 [*] (.051 [*])
	High _{Mean + 1SD}	.052 ^L (-.074 ^L)	.038 ^L (.035 ^L)	.121 ^{*L} (.193 [*])	.162 ^L (.074 ^L)	.121 [*] (.215 ^{*H})
		Direct effect	Direct effect	Direct effect	Direct effect	Direct effect
		-.019 (-.061)	-.010 (-.052)	-.028 (-.068)	-.116 (-.154)	-.065 (-.090)

Note. $N = 70$ (upper panel) and 71 (lower panel). SD = standard deviation. Values in parentheses were computed without controls (used in Tables 3 and 4) in the model.

^a Organization-level variance in personality. ^H = effect is significantly higher than the corresponding indirect effect at the other extreme moderator level ($p < .05$). ^L = effect is significantly lower than the corresponding indirect effect at the other extreme moderator level ($p < .05$).

* $p < .05$ based on the bias-corrected bootstrapped 90% confidence interval (number of bootstrapped samples = 1,000).

Discussion

Drawing on ASA theory, SHRM scholarship, and recent human capital research, this study explores organization-level emergence of personality (i.e., personality-based human capital resources) and its direct, interactive, and (conditional) indirect effects on organization-level outcomes. First, we found that organization-level mean Emotional Stability, Extraversion, and Conscientiousness significantly predict organization-level managerial job satisfaction and labor productivity but do not significantly predict financial performance. The direct effects of organization-level personality, whether in the form of the mean or variance, are rarely moderated by personality bandwidth. Furthermore, the direct effects of organization-level mean personality generally are stronger for more proximal firm-level outcomes (e.g., managerial job satisfaction, labor productivity) than for financial performance. Second, we found that organization-level mean and variance in emotional stability interact to predict all three organization-level outcomes, and that organization-level mean and variance in extraversion interact to predict firm financial performance. Specifically, the effects of organization-level mean personality are positive when variance is low, but are null or slightly negative when variance is high. Third, we found that the indirect effect of organization-level mean emotional stability on labor productivity (via managerial job satisfaction) is more positive when organization-level variance in emotional stability is lower. Furthermore, the indirect effects of organization-level mean emotional stability, extraversion, and conscientiousness on financial performance (via labor productivity) are more positive when organization-level variance in these traits is lower.

Theoretical Implications

There is ample evidence that organizations that use more rigorous selection practices perform better than organizations that do not (Combs, Liu, Hall, & Ketchen, 2006; Huselid, 1995). This

evidence is often used in support of RBT. However, demonstrating that selection or other HR practices contribute to firm performance without measuring human capital resources provides only modest support for the RBT because a core tenet of RBT is that a firm can achieve and sustain a competitive advantage through its resources, not its practices (Barney, 1991; Ployhart, 2012; Wright, Dunford, & Snell, 2001). Interestingly, even when human capital resources are measured, the measures have tended to focus on education or experience-based resources (Crook et al., 2011). The present study offers new, direct support for RBT by showing that higher personality-based human capital resources, particularly when they are uniformly high across employees (i.e., low organization-level variance), lead to higher financial performance through enhancing labor productivity. More importantly, the indirect effects of personality-based human capital resources on firm financial performance (via labor productivity) are stronger when organization-level variance in personality is lower. This finding also suggests that the idea that “more is better” is insufficient for personality (and maybe other KSAOs) at the organizational-level; we also need to consider the homogeneity (variance) of KSAOs among individuals in an organization, which can affect collective processes (e.g., climate, coordination).

Furthermore, the present findings suggest that the relationships of personality to performance and satisfaction at the organizational level are at least similar to those at the individual level (Barrick et al., 2001; Judge et al., 2002). This result may seem surprising, given that firm-level outcomes are often thought to be more difficult to predict than individual-level outcomes (e.g., due to various environmental factors that affect firm performance; Ployhart & Schneider, 2012). This suggests that individual-level validity estimates may underestimate the organizational-level effects of personality by not tapping collective processes (Narayan & Ployhart, 2013; Ployhart & Hale, 2014). Furthermore, the relationships between personality-based human capital resources and firm performance found in this study are similar to or stronger than those

Table 6

Organizational-Level Emergence of Broad Versus Narrow Personality Traits and Their Correlations With Outcomes

Personality	Correlation (<i>r</i>) of organization-level mean personality with:			Correlation (<i>r</i>) of organization-level variance in personality with:		
	Managerial job satisfaction	2008 Labor productivity	2008 ROE	Managerial job satisfaction	2008 Labor productivity	2008 ROE
Emotional Stability	.328	.197	.112	-.338	-.194	-.211
Anxiety (R)	.315	.087	.071	-.278	-.164	-.254
Angry Hostility (R)	.358	.220	.122	-.311	-.140	-.154
Depression (R)	.349	.185	.098	-.456	-.201	-.191
Self-Conscientiousness (R)	.208	.219	.166	-.186	-.080	-.090
Impulsivity (R)	.187	.128	.017	-.330	-.180	-.120
Vulnerability (R)	.305	.216	.125	-.217	-.142	-.129
Extraversion	.322	.282	.171	-.332	-.256	-.194
Warmth	.294	.254	.154	-.338	-.236	-.165
Gregariousness	.359	.297	.180	-.350	-.196	-.145
Assertiveness	.319	.241	.170	-.248	-.250	-.192
Activity	.345	.279	.137	-.326	-.221	-.179
Excitement Seeking	.015 ^L	.116	.163	-.229	-.116	-.105
Positive Emotionality	.257	.245	.110	-.306	-.200	-.113
Conscientiousness	.388	.255	.133	-.288	-.096	-.064
Competence	.326	.167	.078	-.340	-.089	-.108
Order	.350	.200	.122	-.218	-.068	-.069
Dutifulness	.299	.229	.064	-.241	-.126	-.058
Achievement Striving	.408	.299	.161	-.247	-.157	-.173
Self-Discipline	.357	.307	.174	-.326	-.119	-.063
Deliberation	.392	.210	.125	-.258	-.097	-.022
Agreeableness	.341	.247	.050	-.129	.079	.209
Trust	.265	.207	.058	-.170	.047	.084
Straightforwardness	.100 ^L	.173	-.056	.016	-.027	.076
Altruism	.290	.223	.070	-.187	-.136	-.100 ^L
Compliance	.386	.223	.045	-.294	-.059	-.004
Modesty	.057 ^L	.019	-.074	-.046	.161	.101
Tender-Mindedness	.183	.099	.121	-.012	.166	.081
Openness to Experience	.054	-.107	-.042	-.128	.012	.016
Fantasy	-.043	-.172	-.073	.066	.133	.034
Aesthetics	-.053	-.015	-.008	-.208	.145	.046
Feelings	-.184 ^L	-.058	-.054	-.021	.154	.042
Actions	.313 ^H	.035	.054	-.227	-.173	-.110
Ideas	.087	-.151	-.053	-.293	-.005	.035
Values	.105	-.084	-.051	.001	-.028	-.190

Note. $N = 71$ for all the variables except for managerial job satisfaction ($N = 70$); (R) = reverse-scored; SD = standard deviation; ROE = return on equity. Correlations equal to or greater than .20 do not include zero in its 90% confidence interval ($p < .05$).

^H = correlation is significantly higher than a corresponding broad personality factor ($p < .05$). ^L = correlation is significantly lower than a corresponding broad personality factor ($p < .05$).

between experience and education-based human capital resources and firm performance (Crook et al., 2011). Thus, as Ployhart (2012) suggested, the relative importance of cognitive versus non-cognitive human capital resources to firm-level outcomes may differ from their relative importance to individual-level outcomes.

Finally, this study provides some interesting insights into the bandwidth-fidelity debate at the organizational-level. We found that narrow personality traits do not have stronger relationships with internal or external organizational-level performance than broad personality traits. This finding is contrary to RBT, which suggests that organization-level emergence of firm-specific (narrow) traits should be more strongly related to firm performance than the emergence of (broad) traits that may be less firm-specific (Crook et al., 2011). However, firm performance is considered a fairly broad criterion (Ployhart, 2012), and some of the bandwidth differences we found that favored broad personality traits may be consistent with the comparability hypothesis, which states that

broad traits should be more strongly related to broad outcomes (Ones & Viswesvaran, 1996). An interesting area for future research would be to compare the predictive value of broad versus narrow traits against broad (e.g., financial performance) and narrower firm performance measures (e.g., number of employee suggestions, number of patents).

Practical Implications

There is skepticism among many practitioners and researchers concerning the value of selecting employees on the basis of self-reported personality measures due to evidence of low criterion-related validity and applicant faking (Morgeson et al., 2007). Further, Ployhart (2012) suggested that one reason why "HR practitioners hold some very different opinions of the efficacy of some selection practices, relative to cumulative findings" is that "our literature does not capture the realities facing organizational

leaders" (p. 78). Organizational leaders and HR practitioners may be more convinced about the efficacy of personality as a selection tool when they see "direct" evidence that personality-based human capital resources meaningfully relate to hard firm performance rather than indirect evidence (e.g., utility) from individual-level findings based on subjective ratings of performance (Ployhart & Schneider, 2012). As an alternative or supplement to utility analysis (the results of which organizational decision makers often discount; Schneider et al., 2000), this study provides direct evidence that personality-based human capital resources can indeed be valuable to organizations by linking them to the kinds of criteria for which organizational leaders and HR practitioners are held accountable (e.g., firm labor productivity, financial performance). In addition, as discussed, the effects of personality-based human capital resources on firm financial performance are stronger when organization-level variance in personality is lower. This suggests that organizations not only should select managers who possess a high level of these personality traits, but also make efforts to retain those managers so that organizations can have a coherent personality profile (e.g., high mean and low variance). This is important because employees in such organizations tend to receive more consistent signals about work-related goals and experience more positive emotions, thus enhancing firm performance.

Study Limitations and Future Directions

This research has several potential limitations. First, job satisfaction was measured using a single-item scale, so the reliability of this measure at the individual level is unknown. However, the organization-level job satisfaction variable used in our analyses (which represents the aggregate satisfaction across at least 20 individuals) was quite reliable. Second, common method variance may have inflated the relationship between personality and managerial job satisfaction, both of which were measured via self-reports in the same survey. To explore this possibility, we randomly split each organization sample into two subgroups and reran the analyses using personality scores from one group and job satisfaction scores from the other group (see Ployhart et al., 2006). The two sets of results were practically the same, which suggests that common method variance may not have played a large role in this study. Nonetheless, we encourage future studies to examine the effects of organization-level personality longitudinally. Third, our conclusions could have been stronger if we had been able to measure organization-level processes (e.g., climate, coordination and cooperation) or emergent states (e.g., cohesion, collective affect) through which personality-based human capital resources may influence labor productivity and financial performance (Ployhart & Hale, 2014). Given the weak mediating effects we found for managerial job satisfaction, direct examinations of other potential mediators would be a fruitful future research direction. Fourth, as discussed in the Method section, fit indices for the FFM model at the individual and organizational levels were less than acceptable, despite the fact that we used one of the most established FFM measures (i.e., the NEO-PI-R). Future research should replicate our findings with this as well as other FFM measures. Finally, the sample size at the organizational level was modest ($N = 71$), and we did not have sufficient statistical power to detect some of the smaller effects that could still be important (e.g., organization-level mean conscientiousness and 2008 ROE; see Table 1). For the

same reason, we could not assess or incorporate change in firm performance over time, which, if tested, may have further strengthened some of our conclusions (see Kim & Ployhart, 2014). We hope that future studies with access to larger, longitudinal samples can investigate questions such as whether changes in organizational-level personality relate to changes in organizational-level performance over time.

Conclusion

Based on ASA theory, SHRM scholarship, and recent human capital research, the present study provides direct evidence that personality-based human capital resources (in the forms of organization-level mean, variance, and their interaction) matter to firm performance. In addition, by taking a strategic perspective, this study suggests that organizations that carefully select employees (particularly managers) based on personality and retain those employees are likely to outperform organizations that do not select on personality.

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Appendix

Omnibus Random-Intercept Mixed-Effect Models Predicting Firm-Level Outcomes

Predictor	Managerial job satisfaction				2008 Labor productivity				2008 ROE			
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Model 1												
Intercept	.00	.14	.00	.13	.00	.11	.00	.11	.00	.11	.00	.10
Firm-level controls												
Firm size			.05	.11			.01	.12			-.02	.11
2007 ROE			.10	.11							.43*	.11
Predictors												
ES_mean	-.09	.25	-.12	.27	-.26	.26	-.27	.27	-.11	.27	-.10	.25
E_mean	.07	.19	.09	.20	.28	.20	.28	.20	.21	.21	.24	.19
C_mean	.41	.26	.42*	.26	.26	.26	.26	.26	.07	.27	.06	.25
Model 2												
Intercept	-.05	.11	-.05	.11	-.01	.32	-.07	.12	-.13	.12	-.13	.11
Firm-level controls												
Firm size			.01	.11			.03	.12			-.03	.11
2007 ROE			-.08	.11							.39*	.11
Predictors												
ES_mean	-.31	.24	-.34	.26	-.48*	.26	-.51*	.28	-.39	.26	-.27	.25
E_mean	-.03	.18	-.04	.18	.20	.20	.22	.21	.09	.19	.12	.19
C_mean	.58*	.25	.60*	.26	.47*	.28	.48*	.28	.38	.27	.27	.25
ES_SD	-.27*	.13	-.31*	.14	-.21	.14	-.22	.15	-.28*	.14	-.08	.14
E_SD	-.16	.11	-.16	.11	-.22*	.12	-.22*	.12	-.19	.12	-.21*	.11
C_SD	-.07	.13	-.06	.14	.11	.15	.12	.15	.13	.14	.06	.14
Interactions												
ES_Mean \times SD	-.51*	.16	-.54*	.18	-.28*	.17	-.26	.19	-.40*	.18	-.25	.18
E_Mean \times SD	.17	.12	.18	.12	-.12	.13	-.12	.13	-.29*	.13	-.32*	.12
C_Mean \times SD	.21	.13	.24*	.14	.18	.15	.17	.15	.25*	.15	.12	.14

Note. $N = 71$ for all the variables except for managerial job satisfaction ($N = 70$); b = coefficient; SE = standard error; ES = Emotional Stability; E = Extraversion; C = Conscientiousness; SD = standard deviation; ROE = return on equity.

* The 90% confidence interval does not include zero ($p < .05$).

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