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Original article

Aggregate personality and organizational competitive advantage

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Based on attraction–selection–attrition theory, human capital resources theory, person-organization fit theory and organizational climate/culture strength theory we hypothesize that (1) Big 5 aggregate conscientiousness, emotional stability and agreeableness will be significantly related to organizational financial performance (only conscientiousness is significant), (2) that interaction effects of Big 5 means and SDs will be reflected in organizational financial performance (not supported), and (3) that Big 5 strength (variance) alone is a significant correlate of organizational financial performance (supported for all but extraversion). In addition, an aggregate of strength across the Big 5 facets is also a significant correlate of organizational financial performance. Limitations and implications of these findings for future research on aggregate personality and practice are discussed.

Practitioner points

- Selection on the basis of conscientiousness will yield not only effective individual performance but may also be reflected in organizational financial performance as well.
- Firms should be attentive to the variance in the attributes of those hired because smaller aggregate variance on all but extraversion Big 5 attributes is significantly reflected in organizational financial performance.

This article concerns the relationship between aggregate individual personality attributes in organizations and organizational performance. We build on the recent emphasis on human capital resources that arises from aggregates of individual differences in organizations (Ployhart, Weekley, & Ramsey, 2009) and the now-confirmed relationship (Oh, Kim, & Van Iddekinge, 2015) between human capital resources as aggregated individual personality and organizational performance. We test Schneider's (1987) homogeneity hypothesis as a consequence of the attraction–selection–attrition (ASA) cycle and show that it is valid even when taking into account country and industry sector attributes. We test the hypothesis that such aggregates of personality will be reflected in organizational financial performance in two ways: (1) the *level* of the aggregate Big 5

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attributes of conscientiousness, emotional stability, and agreeableness and (2) the *variance* (strength) of the Big 5 attributes via person – organization fit and culture strength thinking. By demonstrating that firm-level means and variances of the aggregate personality of a diverse sample of 167 companies from different industries and countries relate to organizational financial performance, we contribute to the idea that aggregates of personality are an important additional variable for understanding the micro-foundations of organizational success (Ployhart & Hale, 2014) and contribute evidence substantiating the long-held belief that personality predictions of individual performance have organizational consequences as well.

A foundation for our work is the idea that because organizations attract, select, and retain particular personalities they then vary in the climate and culture that exists in them (Schaubroeck, Ganster, & Jones, 1998; Schneider, 1987). Climate and culture are in turn known to be reflected in the kinds of behaviours that characterize them and their success (Schein, 2010; Schneider & Barbera, 2014). This perspective is based on an underlying belief in equifinality – that there are numerous ways for organizations to be effective. That is, the more organizations are characterized by relatively homogeneous personalities – by identifiable climates and cultures – the more effective they will be (Hartnell, Ou, & Kinicki, 2011) because employees in such organizations have superior fit with them and thus create the strong cultures related to effectiveness. We do not directly assess the climates and cultures associated with homogenous personalities but suggest that the person-organization fit (Kristof-Brown & Billsberry, 2013; Ostroff & Judge, 2007) that follows from homogeneity has positive organizational (not just individual) consequences due to strong climates and cultures (González-Romá & Peiró, 2014) – and coordination and commitment – such good fit promotes (Beer, 2009).

The article unfolds as follows. First, we summarize Schneider's (1987) ASA model of organizational personalities and human capital resources theory implying how the aggregates of KSAOs resulting from ASA might be reflected in firm performance (Kim & Ployhart, 2014; Ployhart & Hale, 2014). Included here is discussion of the recent unique thinking and findings of Oh *et al.* (2015) indicating support for the proposal that relative homogeneity of personality in organizations exists and, further, can be reflected in organizational performance. Then, we introduce the climate/culture strength metaphor (González-Romá & Peiró, 2014) and person-organization fit theory (Kristof-Brown & Billsberry, 2013; Ostroff & Judge, 2007) as bases for hypothesizing that aggregate personality homogeneity itself is a significant correlate of organizational financial performance. Finally, we note the absence of organizational performance evidence in the personnel selection research literature (Ployhart & Schneider, 2012; Schneider, Smith, & Sipe, 2000) and how research on human capital resources may be effective in revealing such evidence.

The article makes three contributions to the literature. First, we replicate the finding that there are significant effects for personality on organizations, substantiating Schneider's original homogeneity hypothesis – and do so showing that such effects are independent of country and industry effects. Second, we conceptualize the effects of aggregate personality on organizational performance within the organizational climate and culture as well as person-organization fit literatures, suggesting that aggregate personality variance (strength) is as much a feature of organizations as is climate and culture strength. Third, we hypothesize and find partial support for hypotheses that both the level of aggregate personality and the variability of such aggregates (strength) reveal on a large sample (N = 167) of multinational companies significant relationships with organizational financial performance.

Schneider's (1987) ASA model and human capital resources

Schneider (1987) proposed that organizations come to have the climates and cultures they have (though he used the word 'situation') because of an ASA cycle that rests on the personality of the founder of the organization (see also Schein, 1985 and subsequent editions of his book for the presumed effects of the founder on the organization). As in Holland's (1997) notion of career environments, Schneider (1987) proposed that organizations develop over time an organizational environment characterized by the people in the organization as a basis for the way the organization looks and feels both to insiders and those viewing the organization from the outside. The basic model says the following: when people think they will fit the organization they join it; when organizations think people will fit it they select them; and when people over time no longer think they fit the organization they will leave.

There have been several studies of Schneider's (1987) homogeneity hypothesis, and they have reported significant effects for organization on personality (Bradley-Geist & Landis, 2011; Giberson, Resick, & Dickson, 2005; Satterwhite, Fleenor, Braddy, Feldman, & Hoopes, 2009; Schaubroeck *et al.*, 1998; Schneider, Smith, Taylor, & Fleenor, 1998). Collectively, these results suggest that there is good reason to expect relative homogeneity of personality in organizations for the sample studied here. Finding such evidence would support the legitimacy of data aggregation within firms to produce an organizational personality index that characterizes organizations based on human capital resources and which may in turn be reflected in organizational performance. Thus, based on human capital resources approaches, we propose that homogeneity of personality in organizations represents an emergent construct, and such construct is as real for what an organization is as the size of the building it occupies and the number of levels in its hierarchy (Schneider, 1987). It is interesting here to cite Johns' (2006) critique of research in our field to ignore context in our work and here we explicitly note the inclination until very recently for research in our field to ignore personal attributes in the aggregate.

Human capital resources theory (Ployhart *et al.*, 2009; Ployhart, Van Iddekinge, & MacKenzie, 2011) proposes precisely that organizational performance is potentially enhanced when organizations attract, select, and retain human capital such that the aggregate of that talent yields comparative advantage vis a vis other organizations. What differentiates the human capital resources approach from more traditional organizational behaviour approaches to understanding organizational performance is the focus on the emergence of organizational performance from the aggregate of the individual-level microfoundation KSAOs of the people in them. Thus, rather than focusing on the *situation* or context (Johns, 2006) as in climate and culture thinking and research for example (Ehrhart, Schneider, & Macey, 2014; Schneider & Barbera, 2014) or organizational *practices* as in what are called High Performance Work Practices (HPWP; Cappelli & Neumark, 2001; Huselid, 1995; Jiang, Lepak, Hu, & Baer, 2012; Posthuma, Campion, Masimova, & Campion, 2013) the human capital resources concept focuses on the emergence of a valuable organizational resource, which is the aggregate of the individual-level KSAOs of the people there – in our case on the aggregate personality of the people in organizations.

In a first of its kind, Oh *et al.* (2015), based on ASA theory and human capital resources thinking as we do here, recently published a conceptual and analytic test of relationship between an aggregate organizational personality index and organizational performance. Oh *et al.* expected and found support for a significant relationship between Big 5 emotional stability, extraversion and conscientiousness, and firm labour productivity but not with firm Return on Equity (ROE); they also found that Big 5 agreeableness produced

the same results. In addition, they expected and found that the variance in their aggregate Big 5 personality indices interacted with the mean to produce some significant effects on an index of organizational financial performance for emotional stability and extraversion.

It is of course difficult to propose specific hypotheses to test with regard to aggregate Big 5 dimensions of personality due to the paucity of theory and research related to such aggregates and organizational performance. Oh *et al.*, for example, proposed no specific hypotheses, but there was a '. . .focus on emotional stability, extraversion and conscientiousness. . .' (2015, p. 936). Conscientiousness and emotional stability are of course the most reliable predictors of individual task performance (Barrick & Mount, 2012; Hough & Dilchert, 2010), so it makes sense to think they would also be reflected in firm performance because it is the effective performance by many individuals at their tasks that is assumed to yield organizational success (more on this later). In addition, in the teams literature there have been consistent findings that conscientiousness and agreeableness correlate significantly with team effectiveness (Barrick, Stewart, Neubert, & Mount, 1998; Bell, 2007; Bradley, Baur, Banford, & Postlethwaite, 2013; Halfhill, Nielsen, & Sundstrom, 2008) perhaps as a function of the cooperativeness and lack of conflict higher levels of agreeableness in teams yields. Finally, from an empirical perspective, there is also work at the country level of analysis that supports a focus on agreeableness as the strongest aggregate personality attribute that significantly correlates with a range of *national* economic performance metrics (Bartram, 2013a).

Based on Oh *et al.* (2015), the findings from the personality research literature on teams (Bell, 2007) and Bartram's (2013a) work on national culture, we hypothesize the following:

H1: Aggregate conscientiousness across organizations will be significantly related to organizational performance.

H2: Aggregate emotional stability across organizations will be significantly related to organizational performance.

H3: Aggregate agreeableness across organizations will be significantly related to organizational performance.

These hypotheses implicitly assume that the variance for these aggregate personality attributes is equivalent thus facilitating the establishment of main effects for them. However, as Oh *et al.* (2015) note, there is no reason to expect that the variances will be equivalent meaning that two organizations with equivalent means may differ in their variances. As Oh *et al.* (p. 937) note, this is important because when the variance is lower '. . .employees receive clearer and stronger signals about work-related goals . . .thus resulting in higher levels of labor productivity and performance (George, 1990; Sy *et al.*, 2005)'. Such thinking resulted in Oh *et al.* testing for and expecting significant interaction effects as do we here:

H4: There will be a significant aggregate mean $\times$ variance interaction effect for conscientiousness on organizational performance such that the effects will be significantly different for high vs. low variance.

H5: There will be a significant aggregate mean $\times$ variance interaction effect for emotional stability on organizational performance such that the effects will be significantly different for high vs. low variance.

H6: There will be a significant aggregate mean × variance interaction effect for agreeableness on organizational performance such that the effects will be significantly different for high vs. low variance.

Note that while no hypotheses are stated regarding extraversion and openness to experience relationships involving those Big 5 attributes will also be explored.

Climate and culture strength and person-organization fit

In Oh *et al.* (2015), it was proposed that the interaction of aggregate personality means and variances would be significantly related to organizational performance, but little was said about the variance itself as a correlate of organizational performance. Thus, although in the text of the article it was not reported on specifically, the results in the paper (see their table 4, p. 941) revealed that the variance alone for emotional stability, extraversion, and agreeableness were significantly related to ROE in the appropriate direction.

The most basic feature of Schneider's (1987) ASA model is his homogeneity hypothesis, so it would seem useful to explore relative homogeneity itself as an important attribute of organizations. That is, in some organizations, homogeneity will be stronger than in others meaning, from a person-organization fit perspective, fit will be stronger in some organizations than in others. Schneider (1987, 2004) clearly stated that aggregate personality in organizations was a foundation for climate and culture, so it follows that the concept of climate and culture strength (González-Romá & Peiró, 2014) is an appropriate conceptual avenue for the present research. Climate and culture strength have effects on organizational behaviour and performance because they reduce ambiguity and increase coordination (González-Romá & Peiró, 2014, p. 499). We propose that this reduction in ambiguity and increased coordination emerges because when strength is high (variance is low) so is person-organization fit and the literature on good fit is supportive of the idea that there will be positive consequences from it. Although there is no research we have found that has used the concept of fit at the organizational level of analysis (there is considerable work at the teams level of analysis; DeRue & Hollenbeck, 2007), it is a small inferential leap to conclude that climate and culture strength is conceptually equivalent to person-organization fit. And in the climate and culture strength literature, it is positive fit (or low variance) that has been shown to be reflected positively in outcomes (Denison, 1990; Gordon & DiTomaso, 1992) because of the coordination and reduced ambiguity it yields. In Beer's (2009) view, establishing coordination among and between individuals and units/departments in organizations is the foundation necessary '. . . to allow cost-effective and timely implementation of its strategic tasks'. This line of thinking and research linking degree of homogeneity to the construct of climate and culture strength and person-organization fit and its potential positive consequences leads to the following hypotheses:

H7a: Strength or relative degree of homogeneity of personality for emotional stability will be significantly related to organizational performance.

H7b: Strength or relative degree of homogeneity of personality for extraversion will be significantly related to organizational performance.

H7c: Strength or relative degree of homogeneity of personality for openness to experience will be significantly related to organizational performance.

H7d: Strength or relative degree of homogeneity of personality for agreeableness will be significantly related to organizational performance.

H7e: Strength or relative degree of homogeneity of personality for conscientiousness will be significantly related to organizational performance.

It is important to note that with regard to these hypotheses concerning strength that it is not essential to note differences based on the Big 5 attributes because in the climate and culture strength literatures, especially the culture strength literature, it is simply strength that matters, not strength on which facet or dimension of climate or culture that matters. An additional note is worth adding as well: both Denison (1990) and Gordon and DiTomaso (1992) showed that it was low variance in total culture survey data across organizations that was significantly related to financial metrics like ROI. This line of thinking leads to a final hypothesis[1]:

H7f: The composite strength or relative degree of homogeneity of personality across all five of the Big 5 personality dimensions will be significantly related to organizational performance.

Personnel selection and human capital resources

In his classic text, which devoted essentially half the book to personnel selection, Viteles (1932, p. 29) put the focus on individual differences for Industrial Psychology (now Industrial and Organizational Psychology or I/O) this way: 'Industrial psychology is based on a study of *individual differences*—of human variability. . .' (Italics in the original). Indeed, two excellent handbooks on personnel selection (Farr & Tippins, 2010; Schmitt, 2012) have recently appeared and a review of their chapters still reveals a focus on individual differences with little concern for studying the contributions of personnel selection to organizational performance (for exceptions in them see Ployhart & Weekley, 2010; Ployhart & Schneider, 2012). As Cleveland and Colella (2010, p. 559) put it: '. . . we traditionally construct and validate personnel selection systems as if the only objective of those systems was to predict future performance at the individual level (e.g., virtually all validation studies use measures of individual job performance as the criterion of choice)'.

The implicit belief of all personnel selection researchers and practitioners is that the validity they reveal for selection devices at the individual level of analysis translates into superior firm performance (Schneider *et al.*, 2000). What has been shown is that firms using validated selection procedures when hiring people improve average performance in the organization compared to not using such procedures (Cascio & Boudreau, 2008), that is, that companies can improve their own performance using such procedures. But that is different from showing that such procedures will also enhance comparative firm performance. As Ployhart and Hale (2014, p. 146) have succinctly stated: 'Predicting individual job performance is a noble and important undertaking, but it should be recognized that there are limits to what individual job performance can tell us about the performance and competitive advantage of firms. The expectation that individual job performance sums to produce aggregate organizational performance is too simplistic under most real-world conditions'. The present article is another attempt to demonstrate how

[1] *We thank an anonymous reviewer for this insight.*

thinking about the KSAOs of people in the aggregate has meaning for organizations and their performance.

Method

Sample

The sample contained 39,966 people from 167 different organizations covering 31 different countries and nested within the 10 industry sectors of the Global Industry Classification System (GICS Sectors as of 2011). The data were gathered between October 2009 and February 2011 and excluded countries with sample sizes of <50 from individual firms. The average sample size per firm was 239.32 (*SD* = 375.68) with a maximum sample size of 3,579. The majority of organizations (68.86%) had multinational samples, with a maximum of 23 countries being covered by one firm.

The sample is a convenience sample obtained from a data base gathered by the consulting firm that administers the personality measure used by and/or being validated by the participating companies. Thus, both job applicants and incumbent employees are included in the sample; the sample includes data for all people tested by the organizations between October 2009 and February 2011. Besides the company name (and thus the industry) and the country of origin of the respondents, no other information was available to us.

Measures

The instrument used was the OPQ32r (SHL, 2013). This has a forced-choice item format and consists of 104 item triplets: each triplet is a set of three statements, where each statement relates to a different scale. For each triplet, the candidate chooses one statement as 'most like me' and one as 'least like me'. OPQ32r uses a multidimensional IRT model to produce 32 normative scale scores. In contrast to most forced-choice instruments which produce ipsative scores, the use of the multidimensional IRT model permits the use of normative statistical analyses. Standard equations are used to compute Big 5 scores from the 32 OPQ scales (Bartram, 2005; Bartram & Brown, 2005). All scales were standardized on the OPQ32r international norm data set (SHL, 2012) and are reported as sten scores (mean of 5.5 and *SD* of 2.00).

Firm-level performance data were extracted from Compustat for the end of 2011 and the end of 2012 for the 167 firms with SHL OPQ32r data. The measures used were Return on Investment (ROI) and Return on Assets (ROA). ROI is fiscal year-end net profits/fiscal year costs of investments $\times$ 100 and higher numbers indicate higher per cent return. ROA reveals how profitable a firm's assets are in generating revenue: Net Income/Average Total Cost of Assets $\times$ 100. Given that the financial performance data were all collected at least one full year after the Big 5 personality data were collected, this will be a predictive rather than a concurrent validity study.

It is well known that ROI and ROA data vary as a function of industry sector (Sharp, Bergh, & Ming, 2013). Sharp *et al.* (2013) discuss the importance of considering industry differences when doing studies across industries and offer a number of ways in which data can be adjusted to take industry sector differences into account. We used the Global Industrial Codes Standards (GICS) 2-digit code to categorize companies by industry. These codes are a result of a 1999 collaboration between Standard & Poor's and Morgan Stanley Capital International.

For this study, industry sector means and *SD*s for each of the ROI and ROA measures were matched to companies listed in a large sample of 850 firms taken from 2011 including the S&P 500 and the S&P Euro 350 (given that the headquarters of the sampled companies were in both Europe, including the United Kingdom, and the United States). Each of the 'raw' ROI and ROA measures were also adjusted by standardizing them for their industry sector (the industry sector mean was subtracted and the result divided by the industry *SD*). Thus, we controlled for industry by subtracting out the mean (average) industry sector scores from each company's financial data as suggested by Sharp *et al.*, and based on Raynor and Ahmad's (2014) helpful details on financial information by industry sector. It is important to note that ROI- and ROA-adjusted means shown in subsequent data tables are corrected for their industry. Sharp *et al.* (2013) succinctly summarize analytic issues when conducting research on organizational company financials across industries, not a problem usually confronted in I/O and OB (with a typical focus on individuals or units within companies) but typical in studies of strategic management across companies in different industries. As will be shown later, correcting for these industry averages had minor impact on the relationships examined with some slightly increasing and others slightly decreasing.

Table 4 shows that for these organizations the ROI and ROA measures are highly correlated (.87 for 2011 and .95 for 2012) and stable over time (with ROI 2011–2012 correlation equal to .73 and equal to .75 for ROA) with the results for the adjusted financial metrics very similar (see Table 4 for the details). The four adjusted measures (2011 ROI and ROA and 2012 ROI and ROA) were then combined into a single index by averaging them. Treating each of the four component measures (ROI 2011 and 2012; ROA 2011 and 2012) as items, their intercorrelations yield a Cronbach's alpha for the combined index of .92.

Analysis overview

The first stage of the analyses was to test for the firm-level homogeneity effect and between-firm effects on personality for the sample of organizations studied here as the relative homogeneity and distinctiveness of the present sample of firms is of interest (Schneider, 1987). As suggested by Bliese (2000) and LeBreton and Senter (2008), we calculated ICC(2), which indicates homogeneity (reliability) within organizations, and ICC(1) which indicates between-organization effects to confirm the homogeneity hypothesis (Schneider, 1987) that an organizational-level index of personality is meaningful.

The second step in the analysis, given the multinational and multi-industrial sector sample with which we were working, required establishing the fact that relative homogeneity was not accounted for by national culture or industry sector differences. For these analyses, organizations were nested under industry sector and as most organizations had multinational samples, organizations, and countries were treated as partially crossed, with country differences being controlled for. The effects of countries, organizations within sectors, sectors, and the overall effect of organizations were examined using the lme4 package in R (Bates, 2010; Bates, Maechler, & Bolker, 2013).

The final step in the analyses explored the hypothesized relationships between the aggregate Big 5 personality scale means, standard deviations, and their interactions with appropriately industry-corrected data for organizational performance.

Results

Basic statistics

Table 1 shows the results for ICC(1) and ICC(2) for the Big 5 dimensions revealing that there is significant homogeneity within organizations, the average ICC(2) = .96, and that there are significant differences between organizations, the average ICC(1) = .09. These ICC(2) results replicate numerous findings supporting the homogeneity hypothesis (Bradley-Geist & Landis, 2011) and support the idea that the aggregate personality data for companies will be quite reliable for the analyses that follow.

Table 1 also presents the results of the multilevel analysis with organizations nested under industry sectors and also partially crossed with countries to test for organization effects independent of national culture effects and industry sector effects. This allows us to effectively control for country differences which might otherwise be confounded with organizational differences (see Bartram, 2013a,b, for details of country-level analyses). The results show that while countries account for more variance than organizations in Big 5 personality dimensions (6.90% vs. 4.46%), organizations clearly have a main effect by themselves on personality. It is also apparent that industry sector has a relatively small effect (0.31%) compared to organizations within sectors (4.15%). By conducting these analyses with country and industry sector as controls, we add to the homogeneity literature the idea that organizations have an independent effect on personality.

Table 2 shows the means, *SD*s, and intercorrelations for the Big 5 scales at the individual level of analysis (N = 39,966), and Table 3 shows the same data plus the intercorrelations for the aggregate *SD*s at the organizational level of analysis.

The means and *SD*s in Table 2 reveal that the sample being studied here is quite representative of known representative samples as they are quite close to the population values of 5.5 and 2.0 (SHL, 2012). Examining Tables 2 and 3 for the Big 5 intercorrelations indicates that they are modestly intercorrelated (average r for individuals is .18 and for the aggregates is .30) with only the relationships between emotional stability and extraversion being relatively high (.53 for individuals and .80 for the aggregates). Table 3 also shows that the intercorrelations of the *SD*s with the aggregate means are weak with a slight tendency towards negative correlations suggesting that perhaps strength is higher when means are higher. We turn next to the relationships between the aggregate means, *SD*s, and their interactions against the financial indicators.

Table 1. ICC(1) and ICC(2) values for organizations and percentages of individual-level variance for the sample accounted for by Country, GICS Sector and organizations within sectors, organizations, and the total organizational variance accounted for by each Big 5 dimension of personality

Scale	ICC (1)	ICC (2)	Country (%)	GICS sector (%)	Organizations within sectors (%)	Organizations (%)	Total (%)
Emotional stability	.080	.954	9.70	0.08	2.22	2.30	12.00
Extraversion	.103	.965	5.99	1.11	5.62	6.73	12.72
Openness	.057	.935	5.57	0.33	4.53	4.86	10.43
Agreeableness	.096	.962	8.12	0.00	4.22	4.22	12.34
Conscientiousness	.105	.965	5.10	0.02	4.17	4.20	9.30
Average	.088	.956	6.90	0.31	4.15	4.46	11.36

Note. GICS Sector is based on the Global Industry Classification System (see text for more on the GICS).

Table 2. Individual level Big 5 correlations, means, and *SD*s (N = 39,966)

	Emotional stability	Extraversion	Openness	Agreeableness	Conscientiousness
Emotional stability	1.000				
Extraversion	.530	1.000			
Openness	.195	.369	1.000		
Agreeableness	.108	.156	−.007	1.000	
Conscientiousness	.234	.161	−.036	.105	1.000
Mean	5.567	5.599	5.407	5.387	5.657
SD	1.969	1.984	1.966	1.979	1.995

***Big 5 Aggregate means and SDs* and their interactions with financial performance**

Table 4 presents the intercorrelations of the Big 5 means and *SD*s and the adjusted and unadjusted financial performance indicators.

In Table 4, only the firm-level mean for conscientiousness correlates significantly (r = .18, p < .05) with the combined ROI/ROA financial index aided of course by the significant relationships with ROI and ROA in 2011. These results provide support for H1 but not for H2 (emotional stability) or H3 (agreeableness). Table 4 also shows that there are significant negative correlations between the corrected firm financial performance index and the *SD*s for all of the Big 5 scales but extraversion, thus supporting H7a (emotional stability), H7c (openness to experience), H7d (agreeableness), and H7e (conscientiousness). In addition, there is a consistent pattern for *SD*s of personality dimensions being significantly related to ROI and ROA in both 2011 and 2012 (with a few of those at p < .06, not p < .05) as well as to the combined corrected performance index.

To test H7f (the composite strength across all five personality *SD*s), we first explored the degree to which the five *SD*s shared common variance. A principal components analysis revealed that the first unrotated principal component of the Big 5 company *SD*s for the total sample of organizations account for 50.09% of the variance. Based on this analysis, we created an overall strength index for each company to run against the ROI/ROA index and the result was a significant correlation (r = −.244, p < .001). This provided support for the hypothesis that relative homogeneity (low variance) in personality across the personality attributes is a significant correlate of corrected organizational financial performance.

Analyses were also carried out to examine the effect of controlling for 2011 performance on the prediction of 2012 performance. The final four columns of Table 4 show that if one controls for 2011 ROI or ROA, both for industry adjusted and unadjusted figures, then there are no significant relationships between Big 5 measures (means or *SD*s) and organizational performance. This is not surprising, as the 2011 and 2012 performance figures are so strongly correlated that effects of change over small periods of time will be relatively small on these relationships.

The results for the test of the hypothesized interaction effects proposed in H4 (conscientiousness), H5 (emotional stability), and H6 (agreeableness) are shown in Table 5. Table 5 reveals that no support was found for these hypotheses. Table 5 substantiates the effects for the *SD*s revealing again support for H7a (emotional stability, β = −.234, p < .005), H7c (openness to experience, β = −.221, p < .007), H7d (agreeableness, β = −.158, p < .040), and H7e (conscientiousness, β = −.149, p < .053). Of course, Table 5 also shows the significant effects for the conscientiousness

Table 3. Organizational level Big 5 aggregate means and *SD*s and their intercorrelations

	Means					*SD*s				
	Emotional stability	Extraversion	Openness	Agreeableness	Conscientiousness	Emotional stability	Extraversion	Openness	Agreeableness	Conscientiousness
Means										
Emotional stability	1.000									
Extraversion	.804	1.000								
Openness	.252	.472	1.000							
Agreeableness	.357	.148	.001	1.000						
Conscientiousness	.440	.235	−.110	.399	1.000					
*SD*s										
Emotional Stability	−.351	−.329	.066	−.046	−.312	1.000				
Extraversion	−.085	−.160	.034	.122	−.185	.611	1.000			
Openness	−.053	−.098	.082	.101	−.162	.487	.647	1.000		
Agreeableness	.033	.005	.025	−.020	.056	.241	.184	.287	1.000	
Conscientiousness	−.161	−.200	−.212	−.006	−.050	.283	.304	.278	.277	1.000
Mean	5.519	5.455	5.424	5.388	5.590	1.879	1.860	1.890	1.878	1.885
SD	0.580	0.649	0.531	0.592	0.594	0.198	0.209	0.192	0.165	0.182

Note. The sample size for any analysis is never smaller than $N = 163$ organizations.

Table 4. Correlations between Big 5 aggregate means and *SD*s and financial indicators and means, *SD*s, and intercorrelations of the financial indicators, together with correlations with 2012 criteria controlling for 2011 levels

	Industry sector adjusted					Not adjusted for industry sector				Adjusted/ Controlled for zROI_11	Adjusted/ Controlled for zROA_11	Unadjusted/ Controlled for ROI_11	Unadjusted/ Controlled for ROA_11
	zROI_11	zROI_12	zROA_11	zROA_12	Combined	ROI_11	ROI_12	ROA_11	ROA_12	zROI_12	zROA_12	ROI_12	ROA_12
Correlations with Big 5													
Firm means													
Emotional stability	.057	.032	.095	.028	.059	.078	.06	.087	.027	−.010	−.046	.004	−.057
Extraversion	.080	.079	.064	.061	.079	.079	.085	.041	.049	.034	.026	.041	.028
Openness	.087	.073	−.020	.028	.047	.107	.091	.009	.051	.019	.055	.019	.066
Agreeableness	.033	.024	.067	−.001	.034	.076	.085	.094	.040	.003	−.059	.043	−.045
Conscientiousness	.186*	.092	.237*	.120	.176*	.204*	.132	.217*	.128	−.050	−.048	−.026	−.053
Firm *SD*s													
Emotional Stability	−.233*	−.146+	−.272*	−.170*	−.228*	−.188*	−.131	−.202*	−.135	.019	.012	.010	.025
Extraversion	−.148+	−.046	−.168*	−.070	−.120	−.096	−.033	−.097	−.046	.076	.055	.055	.039
Openness	−.172*	−.146+	−.218*	−.180*	−.199*	−.159*	−.145+	−.193*	−.177*	−.039	−.050	−.044	−.051
Agreeableness	−.129	−.133	−.201*	−.133	−.165*	−.128	−.152*	−.204*	−.155*	−.063	−.001	−.087	−.005
Conscientiousness	−.182*	−.096	−.171*	−.143+	−.165*	−.192*	−.124	−.220*	−.185*	.039	−.041	.025	−.032
Financials Mean	−0.153	−0.221	−0.228	−0.282	−0.221	8.517	6.722	4.493	3.546				
Financials *SD*	1.302	1.238	1.236	1.316	1.143	14.361	13.270	6.572	7.388				
zROI_11	1.000												
zROI_12	.684	1.000											
zROA_11	.892	.639	1.000										
zROA_12	.631	.952	.656	1.000									
Combined	.892	.912	.886	.902	1.000								
ROI_11	.930	.636	.828	.588	.830	1.000							
ROI_12	.686	.940	.648	.893	.882	.730	1.000						
ROA_11	.805	.609	.914	.631	.823	.868	.708	1.000					
ROA_12	.636	.898	.663	.932	.871	.669	.948	.746	1.000				

Notes. A z prior to a financial metric indicates it is adjusted. The sample size for any analysis is never smaller than $N = 163$ organizations and significance indicators take into account the actual sample size.
*$p < .05$; +$p < .06$.

Table 5. Interaction effects of means × *SD*s on combined adjusted financial metric

	B	*SE*	β	*t*	Significance
Emotional stability					
(Constant)	−.199	.091		−2.175	.031
Means	−.009	.096	−.008	−0.097	.923
*SD*s	−.267	.093	−.234	−2.876	.005
Means × *SD*s	.065	.082	.062	0.789	.431
Extraversion					
(Constant)	−.228	.089		−2.550	.012
Means	.056	.094	.049	0.600	.549
*SD*s	−.129	.090	−.113	−1.438	.152
Means × *SD*s	−.043	.084	−.041	−0.509	.612
Openness					
(Constant)	−.227	.087		−2.597	.010
Means	.090	.090	.078	0.995	.321
*SD*s	−.242	.088	−.211	−2.739	.007
Means × *SD*s	.073	.090	.063	0.806	.421
Agreeableness					
(Constant)	−.218	.087		−2.497	.014
Means	.018	.088	.016	0.210	.834
*SD*s	−.181	.087	−.158	−2.070	.040
Means × *SD*s	.173	.095	.140	1.816	.071
Conscientiousness					
(Constant)	−.217	.087		−2.505	.013
Means	.205	.088	.179	2.333	.021
*SD*s	−.170	.087	−.149	−1.951	.053
Means × *SD*s	.084	.084	.077	0.999	.319

mean (β = .179, $p < .021$). Because both the mean and *SD* were significant for conscientiousness, we also ran a regression analysis for the combination (not shown here). For conscientiousness, the $r = .176$ for the mean alone is increased (*R*sq change = .025, $p = .040$) to $R = .236$ ($p < .001$) with the addition of the *SD*. For no other facet of the Big 5 were there significant *R*sq changes for the addition of the *SD*s to the mean against the performance indicators (except of course that the *SD* was significant where it alone was significant).

Discussion

This research effort was an attempt to explore aggregate personality across organizations. The conceptual foundations of the article were based on the ASA cycle of Schneider (1987), the recent article by Oh *et al.* (2015) hypothesizing and showing organizational consequences of aggregate personality data for managers across organizations, and the human capital resources idea that aggregates of KSAOs can be an important micro-foundation for understanding organizational performance (Ployhart *et al.*, 2009). We replicated numerous earlier findings (Bradley-Geist & Landis, 2011) that there is a significant effect for organizations on personality and added evidence that this effect was independent of national culture and industry sector. We hypothesized that company-level aggregate conscientiousness (H1), emotional stability (H2), and agreeableness (H3)

would be significant correlates of organizational performance but only conscientiousness was significant against a 2-year index of ROI and ROA for the organizations studied. We also hypothesized (H4, H5, and H6), based on findings of Oh *et al.* (2015), that organizational personality strength (as indexed by aggregate *SD*s) for the same three facets of the Big 5 would moderate the relationships between Big 5 means and organizational performance but these hypotheses received no support.

On the other hand, in support of H7a (emotional stability), H7c (openness to experience), H7d (agreeableness), and H7e (conscientiousness) there were significant findings for organizational personality strength alone predicting the organizational financial performance index (all but H7b for extraversion). We based our hypotheses for the effects of organizational personality strength on the climate and culture literature (González-Romá & Peiró, 2014), the notion of person-organization fit as a factor in people working more easily together (Beer, 2009; Ostroff & Judge, 2007) and data shown in Oh *et al.* (2015) that had not been discussed by them (significant *SD* effects for emotional stability, extraversion, and agreeableness).

In particular, in the culture literature, the issue of strength has been central to the construct (Ehrhart *et al.*, 2014) indicating that the stronger the culture the more effective the organization will be (Denison, 1990). Typical definitions of culture strength (see table 26.1, p. 497 in González-Romá & Peiró, 2014) include terms such as 'agreement' or 'alignment' or 'pervasiveness' but, interestingly, do not refer to the *level* of the culture of interest. Thus, in this literature it is not how much of a culture facet or dimension exists but the strength with which it exists that is important. González-Romá and Peiró note that culture strength is thought to influence organizational performance by reducing ambiguity, increasing coordination, and reducing the need for formal control systems – precisely what organizational scholars like Denison (1990) and Beer (2009) argue are the requirements for organizations to be successful.

Indeed, the consistent findings for strength across four of the five Big 5 dimensions plus the evidence provided by the aggregate strength indicator across all 5 facets of personality also provides indirect support for the literature on person-organization fit which argues that good fit has positive consequences (Kristof-Brown & Billsberry, 2013; Ostroff & Judge, 2007). Of course, it is important to recall that aggregate conscientiousness was significantly related to financial performance and, in addition, when conscientiousness was strong that the mean plus the *SD* yielded a significant multiple *R* ($R = .236$, $p < .001$) prediction of the financial performance index.

Unfortunately, to our knowledge this is the first study of aggregate personality that has explored the issue of personality strength in depth so how it fits with other literature on personality and person-organization fit is not as clear as might be desired. Drawing on the climate and culture strength metaphor might provide for additional such efforts given that this literature (González-Romá & Peiró, 2014) has been agnostic about promoting one facet of culture as being more important than others. And, as we were able to show, it is the aggregate strength (homogeneity) across the Big 5 personality dimensions that yield the strongest correlate of the financial performance index. Perhaps as the climate and culture strength literatures suggest, homogeneity of personality in organizations limits ambiguity and encourages cooperation so that success will follow (Beer, 2009; Denison, 1990; Gordon & DiTomaso, 1992); research on this issue is clearly needed. When and if the organizational behaviours that would follow from the various Big 5 dimensions can be specified in their relationship to organizational success, perhaps it is a focus on strength of the Big 5 in organizations that provides a more immediate vehicle for understanding the ways in which aggregate personalities get reflected in organizational outcomes.

It is useful to note that, like all seemingly positive things in organizations, too much strength might not be to the long-term benefit of organizations. Schneider (1987) noted in his original presentation of the ASA cycle that the natural inclination for organizations to achieve good fit might have negative consequences because it can lead to routinization, rigidity, and inflexibility. These are of course not useful in an ever-changing world. At least in the short run, though, the present results showing that positive conscientiousness plus high strength on conscientiousness was the only combination of the mean plus the *SD* that produced a significant increase in R is an interesting finding. Indeed, the findings in support of H7f, that aggregate homogeneity across the Big 5 attributes yields superior performance, is the antithesis of what Schneider would predict.

Limitations

An obvious limitation in the present effort was the absence of data to examine as potential mediators of the aggregate personality – organizational performance link. Oh *et al.* (2015) had job satisfaction and labour productivity as links between their manager aggregate mean personality data and financial outcomes and they found no direct links to the Return on Equity (ROE) financial outcome they studied. As noted earlier, however, they did find significant direct effects for *SD*s, as did we. In Oh *et al.*, labour productivity and job satisfaction served as mediators between the means and the financials. Had we been able to collect climate/culture data for the organizations in the sample, these might have served to be useful mediators in the links we explored. For example, regarding conscientiousness, it would have been useful to gather data on the people's efficiency and attention to detail as well as their achievement behaviours, behaviours likely to be seen in a conscientious organization, to use such data as the link between aggregate Big 5 conscientiousness and the financial metrics.

A second limitation is the lack of data on occupations as an additional source of accountable variance for the analyses in Table 1 concerning Schneider's (1987) homogeneity hypothesis. While a contribution to the homogeneity of personality literature was our inclusion of country and industry sector, it would have also been useful to have had data on occupations. This is true because such data have been shown to also account for significant variance in personality at the aggregate level of analysis (Ployhart *et al.*, 2009; Satterwhite *et al.*, 2009; Schaubroeck *et al.*, 1998).

A third limitation concerns the implicit causal stream that underlies the research: aggregate personality causes organizational performance. The ASA model is a cycle meaning that elements of the model (e.g., attrition) cycle back to influence earlier parts of the model (e.g., attraction) precisely because of the homogeneity attrition yields. That is, Schneider (1987) hypothesized that the more homogeneous organizations become in terms of personality the more attractive they are to potential candidates. But organizational performance clearly also plays a role in the ASA cycle with more successful organizations yielding stronger cultures (Schein, 2010). For example, Google has more applicants for jobs than does Kodak making it more likely for it to be able to select people who fit it well. And the data reported here suggests precisely this impact of strength with stronger aggregates (low *SD*s) yielding improved performance perhaps because those organizations that are superior performers attract people like those who are already there – and the cycle repeats.

It is interesting to note in this light that more successful organizations may not only be able to attract and therefore select people who will be a good fit for the organization but also that they would be able to choose from among those who are most conscientious.

Given that we have known for some time that conscientiousness is the superior personality predictor of individual performance (Barrick & Mount, 2012) and we now add to that the finding that it may also be the aggregate personality facet that is the significant predictor, it follows that more successful companies with more applicants have more opportunities to choose those with higher levels of conscientiousness. Had we been able to access the 2008 Compustat financial data for the 167 companies in this sample we might have been able to explore this causal stream with financials prior to when the OPQ data were collected but it was not possible for us to access these financial data. In any case, it is always important when doing research in real organizational systems to acknowledge the likelihood that reciprocity in causal priority is to be expected.

It is also necessary to note that the results shown in Table 4 for the mean levels of the Big 5 against ROA and ROI revealed that predicting 2011 outcomes were consistently stronger than for those predicting 2012. But the data for the *SD*s were not so different across the 2 years. The results on the means for 2012 were somewhat surprising given the stability of the outcome metrics over time (with ROI 2011–2012 correlation equal to .73 and to .75 for ROA). But perhaps this could be expected in that the 2011 performance measures are closer in time to the dates the personality data were collected. Similarly, when we controlled for the effects of 2011 performance on the prediction of 2012 performance, there were no residual relationships between Big 5 measures and performance in 2012, suggesting that change effects were small and not accountable for in terms of personality. Of course, reliability issues can also explain relationships and the ICC(1)s here, while not strong (average of .09) could also be a factor operating for the means but, as LeBreton and Senter (2008) note, when the ICC(2) values are strong as they were here, they are able to reliably differentiate groups.

Finally, the OPQ data base used for these analyses was on a convenience sample with many of those in the data base being applicants rather than incumbents. Unfortunately, we do not know the proportions, but it is clear to us that if the data were on incumbents then the full ASA cycle would have had a chance to operate. In sum, the present results may be an underestimate of what results would like if the sample had been one of incumbents where the full cycle would have had a chance to occur.

Practical implications

The research on Big 5 facets of personality at the individual level of analysis has continuously shown that it (especially conscientiousness and emotional stability; Barrick & Mount, 2012; Hough & Dilchert, 2010) is a reliable predictor of numerous facets of work behaviour. The results here indicate that in the aggregate conscientiousness is also a predictor of organizational performance substantiating the implicit assumption of personnel selection researchers. While the results here were statistically significant, they were not strong but as only the second exploration to our knowledge (Oh *et al.*, 2015) of the aggregate personality construct against organizational performance, it is a further suggestion of the possibilities of this approach. This will be especially true when the climate and culture we think these aggregate personality data yield is also included in future research in the mediator role we propose. Clearly, companies should continue to hire people with higher scores on conscientiousness. In addition, and keeping in mind the cautions mentioned earlier about too much of a good thing, organizations might be best served by attending to the variance in the kinds of people they attract, select, and retain because the lower the variance the more likely it is that the cooperation and coordination required for effectiveness will emerge. That is, the lower the *SD* of those hired on the

various dimensions of the Big 5 the more likely it is that the company will be financially successful – and more financially successful than companies competing in the same industry yielding the competitive advantages from human capital resources about which Ployhart (2012; Ployhart & Hale, 2014) has so effectively written.

Conclusion

Based on ASA theory, the human capital resources model of organizations and recent conceptual and data advances by Oh *et al.* (2015) we studied aggregate Big 5 personality dimension means and *SD*s across 167 organizations as correlates of (industry-corrected) organizational financial performance. We hypothesized that conscientiousness, emotional stability, and agreeableness would significantly predict organizational financial performance, but this was true only for conscientiousness. We hypothesized that Big 5 means and *SD*s for the same three facets of the Big 5 would interact in predicting financial outcomes, but these hypotheses were not supported. We also hypothesized that aggregate Big 5 *SD*s alone would predict organizational financial performance and the data revealed that for all but extraversion the *SD* was a significant correlate – and, in addition, the *SD* for conscientiousness added significantly to the mean in prediction of the financial outcomes. We interpreted the meaningful role of the Big 5 *SD*s within the organizational culture strength and P–O fit literatures proposing that low *SD*s (high strength) serve to reduce ambiguity and produce cooperation among people of a similar sort at work, two socio-psychological bases of organizational effectiveness (Beer, 2009; Denison, 1990).

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