SEEKING RIGOR IN SOUTH AFRICAN BUSINESS RESEARCH: ASPIRATIONAL PRINCIPLES IN CONTRAST TO A RECENT PUBLICATION

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Abstract

Studies of organisational success and other aspects of management are critical in understanding and improving critical areas of African economic stability. This article seeks to urge high levels of rigor in South African research in this area, notably empirical research, proposing several aspirational research principles. First, the article considers claims of uniqueness versus the practical value of embedding research as a replication in a well-considered wider body of knowledge. Second is the desirability of conforming to sufficiently high norms of model fit and effect size and accuracy. Third is empirical comparison of South African studies with previous findings, with attendant possibilities for new theory development. Fourth is proper tests for and treatment of common method bias. Fifth is specification of appropriate sets of constructs. Finally, this article proposes specification of alternate models that will add substantial rigor to such research. In advocating these possibilities, the current article contrasts these aspirational principles to a recent SAJEMS article. This critique serves an exclusively illustrative purpose, showing some pitfalls of not conforming to the aspirational principles, the benefits of explicitly including certain easy to achieve solutions, and the ease with which greater rigor can sometimes be achieved. Ultimately, this article seeks to constructively advance African business research standards.

Key words: research methodology, empirical and quantitative research, uniqueness, common method bias, small business

JEL: B40, C18, 52, M13

1 Introduction

This article seeks to advance the rigor of South African research into the business arena. Many areas of business research are widely regarded as critical economic arenas, with substantial promise for broad-based wealth generation, job creation, and other benefits (e.g. Liedholm & Mead, 2013).

The aim of this article is to encourage greater rigor in business research by advocating certain research principles, some of which are well accepted in theory but not always applied, and others which are rarely considered but which I argue can do much to advance the standard of our quantitative methodological practices. The article uses a recent contribution to the South African small business literature by Farrington (2012) as an illustration of the pitfalls of research that does not address at least some of these principles. The intention of this article is not to critique this example per se. Farrington (2012) is certainly not the only publication in this area which may have been used for this purpose. However, this article argues that it serves as a useful example against which the research principles advocated might be compared.

The following sections therefore discuss the specific context of the critiqued article, and thereafter address each major research principle in succession, using Farrington's (2012) article as an illustrative case.

2 The context of the critiqued article

The psychology of entrepreneurs and small business owners forms a central pillar in research investigating the drivers of small business success (e.g. Begley & Boyd, 1988; Jain 2011; Wiklund, Patzelt & Shepherd, 2009; Xavier, Kelley, Kew, Herrington &

Vorderwülbecke, 2013; Frese, 2009; Rauch & Frese, 2000; Shaver, 2010).

Personality of small business owners is a fecund subset of this literature (Beugelsdijk & Noorderhaven, 2005; Brandstätter, 2011; Frank, Lueger & Korunka, 2007; Rauch & Frese, 2007; Zhao, Seibert & Lumpkin, 2010). Research has investigated a wide variety of personality constructs, including tolerance for risk, locus of control, creativity, individualism, achievement motivation, and innovation (Collins, Hanges & Locke, 2004; Farrington 2012; Stewart & Roth, 2004 & 2007; Zhao et al. 2010). The Five Factor Model (FFM) is a useful taxonomy that has enjoyed increasing attention in the context of entrepreneurial outcomes. The FFM employs the facets of Extraversion, Openness, Conscientiousness, Agreeableness, and Neuroticism (Emotional Stability being the positive analogue).

In this vein, Farrington (2012) provides what is probably the first South African data assessing linear relationships between the personality of small business owner-operators (as measured by the FFM) and success of their businesses as measured by growth and financial performance. (I employ capitalisation of key variables hereafter to highlight key constructs). Farrington (2012:383) suggests that no prior model can be found that uses the five-factor model of personality to explain small business success.

I do not repeat the theory underlying Personality and the FFM here, or that surrounding the use of small business Growth and Financial Performance as key outcomes. Farrington (2012) has undertaken an adequate outcome of these, and in addition she discusses in depth the various arguments for links between Personality and business Growth and Financial Performance. I refer the reader to that explication for the sake of brevity (see, for instance, Barrick & Mount (1991) and John, Naumann & Soto (2010) for more on these theory building blocks).

Farrington's (2012) linear hypotheses propose positive relationships between the personality factors of extraversion, conscientiousness, openness to experience and agreeableness with small business success, and negative relationships between Neuroticism and the business success.

As discussed previously, the following sections suggest some aspirational research principles for such work, and uses Farrington's (2012) article as an illustration either of the pitfalls of falling short of these or of the positive steps that can be taken to extend and improve our local research. Exclusively positive contributions are sought in this regard.

3
Embedding studies: uniqueness vs. replication

It is certainly desirable that South African researchers undertake unique research, and it would hardly be controversial to suggest that such researchers should defend any claims to uniqueness by ensuring that similar work has in fact not essentially been published elsewhere. The latter step clearly requires a careful literature review, with a sober consideration of prior research applicability to the researcher's own study.

A particular danger in this regard is the careful scrutiny of the many sub-disciplines that may contain pertinent commentary on a particular business topic. Small business research, for instance, may of course vest in 'obvious' categories of outlets such as management and business, less derivative but commonly referenced areas such as psychology, economics and sociology, and in areas perhaps less commonly accessed such as economic geography. These multiple sources of information are not always noticed. The ISI citation indices, for instance, delineate economic geography from other disciplines mentioned above because of the distinction between social science and science categories. Similar problems may arise with some search engines such as JSTOR or ABI INFORM. However, cross-cutting search engines increasingly lessen this risk.

The desirability for claims of research uniqueness, however, presents an interesting divergence from the reality of much of our publishing. Uniqueness at the highest level of application involves genuinely new theoretical ideas or linkages, which involve "the extent to which it runs ahead of existing empirical research in terms of alerting us to research opportunities hitherto unanticipated (Lakatos, 1970)" (Kilduff, 2002:252). Rynes (2002)

notes that claims to uniqueness need to show high incremental contribution, a certain ability to add views that are not obvious, and importance to the management world (see also Corley & Gioia, 2011). Some South African management research indeed makes theoretical contributions, but, arguably, more work builds within the boundaries of established bodies of theory, perhaps with relatively limited twists on existing models or limited methodological or empirical uniqueness.

The alternative to claims of high-level uniqueness is to acknowledge openly that the article is (mostly) a replication or extension in a particular geographic, temporal, sectoral, or other context. The context provides some localised 'uniqueness', but really at a lower level of empirical differentiation, unless the researcher takes explicit steps to incorporate theoretically defensible additions to the core thinking (such as new theory based on cultural differences). Despite the reluctance of social science researchers to do purely derivative research – perhaps because journals are loath to publish these - replications and contextual extensions not only have value, they sometimes have even more value than does work that is completely unique (Uncles & Kwok, 2013). This is because the business world is saturated with models and theories most of which have extremely scant support. Establishing and confirming the applicability of existing theory is valuable, especially when new contexts are under investigation (e.g. see Easley, Madden & Dunn, 2000; Goldsby & Autry, 2011; Hubbard & Lindsay, 2013; Uncles & Kwok, 2013).

This article advocates for South African researchers to differentiate strongly between work that is genuinely unique at the level of new theory and that which is essentially replication or extension. Where the latter is true, the researcher should fight to embed the research in local contextual nuances that may alter effect sizes or even directions of findings, or at least lend alternative possibilities to discussions and implications of findings.

The critiqued article is perhaps a case in point. Farrington (2012:383) states that "As far as can be established, *no* studies using the five-factor model of personality exist attempting to investigate whether the personality dispositions of small-business owners have an influence on the success of their business" (my italics). This claim is, unfortunately, rather radically over-stated. In contrast, much similar work had previously been achieved. As a possible illustration, Zhao et al. (2010) had previously published a meta-analysis of research precisely on links between the Big 5 personality factors of entrepreneurs and business performance, based partly on a 2006 Academy of Management proceeding. Some 28 months had passed between the *print* publication of Zhao et al. (2010) and the *acceptance* of Farrington's article, and the 2010 meta-analysis covers some 60 prior sources and 66 independent samples, all with at least some measure of association between FFM constructs and entrepreneurial business performance (see Table 1 below for a summary). Even if Farrington was writing her contribution at or after that of Zhao et al., the many contributions that feed into the meta-analysis were surely available to her.

Table 1

Summary of Zhao et al. (2010) collection of past FFM-FIRM Performance studies

	Growth		Profitability		Overall performance	
	K	N	K	N	K	N
Conscientiousness	13	1,554	14	1,801	24	3,193
Openness	9	1,406	6	998	15	2,461
Emotional stability[a]	29	4,446	8	1,588	22	2,845
Agreeableness	-	-	-	-	9	1,476
Extraversion	-	-	-	-	4	931

[a] *Emotional stability is the positive analogue of neuroticism. k = independent sample sizes, N = number of respondents in combined samples. Zhao et al. (2010) do not present meta-analytical results for Agreeableness or Extraversion on Growth or Profitability.*

An argument could perhaps be made that Farrington's study is limited to small businesses and the meta-analysis of Zhao et al. (2010) is targeted at entrepreneurs, an important distinction. However, the note above regarding looking to other fields and sub-fields seems important here. An analysis of the sources used by Zhao et al. suggests many sources that would apply to the small business context.

As stated previously, the intention of this section is not to cavil overly against Farrington's (2012) claim of uniqueness. There need be no doubt that she was unaware of this body of international research. However, it is necessary to set the record straight for the South African scientific community and embed the Farrington research in its proper international context. I take this further and compare her results to the international findings below. Generally, South African research that is embedded in a well-established milieu, even with some differences, would perhaps best be explicitly positioned as such.

4
Size and accuracy in quantitative methodologies

Since much business research utilises quantitative methodologies, this article focuses substantial comment on such routes of enquiry. Many of these studies follow correlational techniques such as correlation analysis, regression, ANOVA and the like.

As has long been noted in the broader methodological literature, claims to model fit, effect size and accuracy of parameters require careful consideration. Tenuous claims to any of these should not easily permeate research that purports to the higher standards of our discipline. Notably, models with little explanatory power, overly low effect sizes, and power issues in the accuracy of slopes should be taken at best with a proverbial pinch of salt.

As the example at hand, Farrington (2012: 392-392) makes several claims regarding her findings. Notably, she infers that her regressions fit and that they show reliable and influential linear relationships.

In reality, Farrington's (2012) results are modest at best. Analyses of R^2s indicate that the Financial Performance regression explains only 7.7 per cent of dependent variable variance, while the Growth Performance regression explains only 6.1 per cent. While not zero, these are extremely low squared multiple correlations that call for caution (e.g. Cohen, Cohen, West & Aiken, 2003). Farrington (2012) would have done well to justify her implicit claims of fit, perhaps through comparison with other entrepreneurial studies linking psychological aspects to these sorts of outcomes.

On Financial Performance there are several statistically significant slopes, including Extraversion (β = .13, p < .05), Conscientiousness (β = .14, p < .05) and Openness (β = .14, p < .05). On Growth Performance, Openness (β = .16, p < .01) and Neuroticism (β = -.13, p < .05) are statistically significant. One extra note here: Farrington's (2012) reported beta for Neuroticism on Growth (which she puts at β = -.065) is incorrectly reported by more than a half, which can be deduced by the fact that derived covariances from her paper result in the exact same R^2 values and paths to multiple decimals excepting that for neuroticism.

In almost any standard interpretation of OLS regression results, R^2 statistics of less than .10 and beta coefficients of less than .20 would usually not be seen to respectively show either fit to a linear model or strong linear relationships (e.g. Cohen et al. 2003). This conclusion carried through to correlations, which are likewise small in effect size.

To illustrate this point, consider the simulated data scatterplots in Figure 1, Figure 2 and Figure 3, representing regression betas (assumed to be controlled for other predictors) of magnitude β = .07, .15, and .20, and noting that Farrington's (2012) smallest and largest betas with statistical significance are .07 and .16 respectively. Few researchers shown such plots would claim any serious linear relation-ships.

Farrington's (2012) claims rest largely on statistical significance of results. The statistical significance of these slopes (and presumably the ANOVA F) is perhaps more likely the result of relatively high power by virtue of sample size (Cohen 1988). To illustrate the power point, I calculate the power functions of this multiple regression using SAS PROC POWER. To achieve power of .80 with a partial correlation of only .06 with such a

regression (far higher than the lowest partial correlation in both Farrington, 2012 and Zhao et al, 2010 of .01) one would need approximately 2,000 respondents. Accordingly, Farrington (2012) should not have been too quick either to embrace significance or to interpret it as substituting for large effects, a point often made in research methodology (e.g. Ziliak & McCloskey, 2004) but too little applied by researchers.

Figure 1

Scatterplot of data with Beta = .09

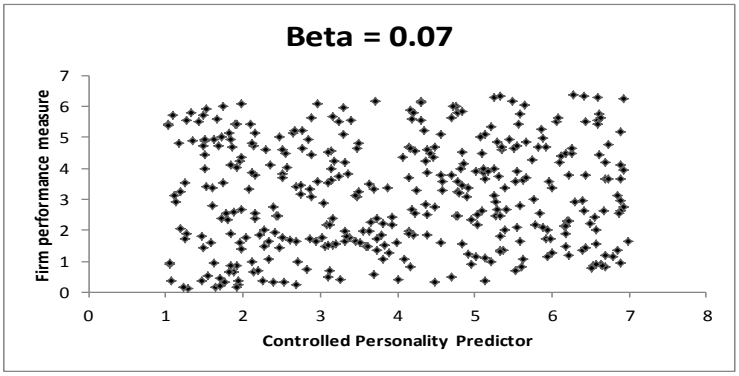


Figure 2

Scatterplot of data with Beta = .14

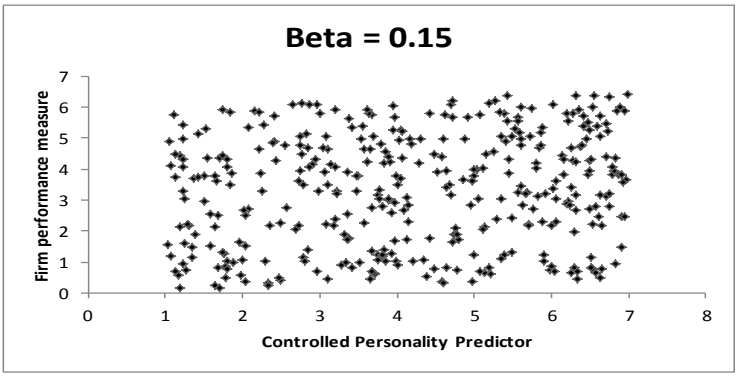
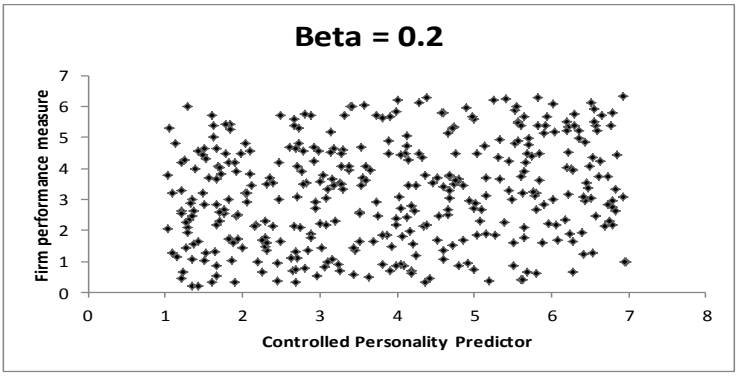


Figure 3

Scatterplot of data with Beta = .20



Essentially, management scientists should interpret findings such as those of Farrington (2012) somewhat cautiously, not necessarily repeating all claims of linear relationships found. Power analyses should become *de rigeur* where available. Moderators seeking out circumstances in which relationships are stronger would perhaps be better in studies such as the example here. This point extends to many similar studies as well – improvements in research reporting by the South African business science community should be sought by journals.

An anonymous reviewer of this article makes the valuable point that Farrington's weak findings are valuable *as* weak findings, in the sense that personality not affecting small business success may be as valuable a conclusion as a positive finding. This is correct. However, it is then incumbent on the researcher not to overstate the findings and to cast the conclusions in the light of weak or no findings.

An extra consideration is whether common method bias (Podsakoff, Mackenzie, Lee & Podsakoff, 2003) may have driven statistical significance, since data is drawn from a one-shot sample and survey with common measurement characteristics. Farrington (2012) explicitly acknowledges this issue. I continue in a constructive vein in Section 6 below with the discussion of common method bias, illustrating options for researchers seeking rigor.

5
Empirical validation: comparability to prior findings

The first aspirational research point urged for caution in claiming uniqueness versus actively but constructively acknowledging essential replication of prior work.

A corollary to the latter point is that researchers seeking to model known relationships in local contexts can and should compare their findings to those already found elsewhere, if possible explicitly (e.g. Hubbard & Lindsay, 2013). Where findings show similar effects to those found elsewhere – even weak or null effects - this is very useful since it allows researchers to make similar recommendations for managerial or other practice. It also adds to general knowledge regarding the similarity of business conditions to conditions elsewhere in a particular area of study. The opposite is also true: divergences from prior findings (or identification with a particular subset of findings elsewhere), enable researchers to develop genuine new ideas regarding contextual differentiation that hopefully can be explicitly developed at a high level of theoretical rigor.

In this regard, it is easy enough to *formally* compare study findings to those found elsewhere, especially where meta-analyses are available or can be synthesised. Such additions to South African studies can easily be achieved and will add substantial rigor and validity.

For example, having critiqued Farrington's (2012) conclusions regarding the strength of her results, I note that her findings are by no means out of line with similar studies worldwide, and show that they are stable in the presence of common method bias. To illustrate, I show and test comparisons between the results of Farrington (2012) and the meta analytical findings of Zhao et al. (2010). To do this I compare R^2 statistics using the Fisher Z comparison test of multiple R statistics, and to compare two given slopes (figuratively β_1 and β_2) I use the slope comparison test for independent samples (Paternoster, Brame, Mazerolle & Piquero, 1998; Clogg, Petrova & Haritou, 1995) as follows:

$$Z = \frac{\beta_1 - \beta_2}{\sqrt{SE_1^2 + SE_2^2}}$$

Equation 1

Zhao et al. (2010) only reconstruct a regression of FFM characteristics on general firm performance, but do give meta-analytical correlations for Conscientiousness, Openness and Emotional Stability (the inverse of Neuroticism) on Growth and Financial Performance (for Extraversion and Agreeableness they only construct correlations with overall performance). To build correlation matrices from Zhao et al.'s findings that correspond with those of Farrington, I follow their approach by using the correlations between FFM characteristics derived from the Ones, Viswesvaran, and Reiss's (1996) meta-analysis. In addition, I use the Zhao et al. (2010) FFM correlations with Growth and Profitability where available. In the case of Extraversion and Agreeableness I

substitute the meta-analytical correlation with general performance into the Growth and Financial Performance correlation matrices.

Table 2 shows the comparisons between Farrington's (2012) regression on Financial Performance and the regression reconstructed from Zhao et al.'s (2012) meta-analytical correlations. The final columns show the differences between parameters, including the R^2 and slopes.

Table 2

Comparisons of financial performance regressions

	Farrington		Zhao et al.		Difference	
	β_F	SE_F	B_Z	SE_Z	B_{F-Z}	SE_{F-Z}
Extraversion	.129**	.050	.047*	.028	.082ns	.058
Conscientiousness	.135**	.053	.096***	.029	.039ns	.060
Openness	.139***	.051	.152***	.028	-.013ns	.058
Agreeableness	.031	.051	-.031	.029	.062ns	.058
Neuroticism	-.027	.053	-.119***	.029	.092ns	.060
R^2	.08		.06		.02ns	

*Notes. ***= p < .01, **= p < .05, *= p < .10. N for Farrington (2012) data is 383, N for Zhao et al. (2010) regressions (estimated as harmonic means of individual component samples) = 1,270. Significance for R^2 differences estimated with Fisher Z test of multiple R. Significance of differences between paths estimated using z-test method of Equation 1.*

Table 2 suggests that Farrington's (2012) Financial Performance regression and that constructed from Zhao et al. (2010) are statistically indistinguishable even at the 90% confidence level.

Table 3 shows the comparisons between Farrington's (2012) Growth regression and that reconstructed from Zhao et al. (2012). The final columns again show and test the differences.

Table 3

Comparisons of growth regressions

	Farrington		Zhao et al.		Difference	
	β_F	SE_F	B_Z	SE_Z	B_{F-Z}	SE_{F-Z}
Extraversion	.069	.051	.060**	.025	.009ns	.057
Conscientiousness	.037	.054	.310***	.025	-.273***	.060
Openness	.162***	.052	.250***	.024	-.088 ns	.057
Agreeableness	-.009	.539	-.070***	.026	.061 ns	.540
Neuroticism	-.126**	.053	-.020	.026	-.106*	.059
R^2	.06		.15		.09***	

Notes as for Table 2, except N for Zhao et al. (2010) regression now N = 1,501.

In this case, the R^2 of Zhao et al. (2010) is .15 and that of Farrington (2012) is .06, the difference of .09 is statistically significant at p < .01. This difference is driven by statistically significant differences between the Conscientiousness path (β = .31 for Zhao et al. and .037 for Farrington, difference = .27 p < .01) and the Neuroticism path (β = -.126 for Zhao et al. and .020 for Farrington, difference = .106 p < .10). However, differences between other paths are not statistically significant.

The conclusion to be drawn from these findings is that Farrington's (2012) research is mostly comparable to the bulk of international findings, a conclusion Farrington herself largely comes to but by far less rigorous comparisons and by comparisons with less relevant literature (in that Farrington largely compares to individual performance literature). The similarities to comparable findings here encourage not only proximal comparability in the sense of Personality-Performance literature but may add ammunition to any arguments that South African small business owner managers are in many respects similar to other entrepreneurs in similar global markets, although this would be

a tentative conclusion. It is an approach that accords with recent authors such as Hubbard & Lindsay's (2013) that *sameness* should be the focus for business research instead of *difference*.

Table 3 shows that the noteworthy exceptions to comparability are perhaps Conscientiousness on Growth (which has a moderate effect in the Zhao et al. 2010 meta-analysis and practically none in Farrington, 2012) and Neuroticism (which is moderate but significant in its effect on Growth in Farrington but negligible in Zhao et al. 2010). Interesting additions to the literature would perhaps be an investigation into whether these effects are systemic and endemic to South African entrepreneurship, if so why, and what this entails. As noted, the rigorous comparison of local versus prior international effects is what can really seed this sort of theoretical differentiation.

6
Stability to common method bias

While the problem of common method bias has long been a feature of cautionary methodological literature, especially in psychological research of a perceptual nature (e.g. Donaldson & Grant-Vallone, 2002; Podsakoff et al. 2003 & Podsakoff, Mackenzie & Podsakoff, 2012), explicit remedies for the issue remain all too uncommon in South African business research.

Common method bias refers to "variance that is attributable to the measurement method rather than to the constructs the measures represent" (Podsakoff et al., 2003:879). Such bias, which may spuriously inflate correlational effects between constructs, may be caused in various ways (Podsakoff et al., 2003 & 2012). These include common sources of data (notably common raters, such as all data being gathered from the same people), effects caused by measurement items (such as when answers to items in a survey are biased by social desirability, complexity, or a common answering format), common item context (such as when external effects create common mood between respondents) and measurement context (such as when a common medium such as a one-shot survey is used to gather data, or gathering measurements at the same time or place facilitates commonality of responses).

A large proportion of South African business research utilises one-shot surveys, gathered from the same respondents at a single period in time, and often using similar or even identical answer scales such as Likert response formats. As illustrated by a large body of methodological literature (e.g. Donaldson & Grant-Vallone, 2002; Podsakoff et al, 2012), this may distort, inflate or depress true relational effects between constructs, although such biases may not always occur and may have been somewhat overstated (Conway & Lance, 2010; Spector, 2006). To the extent that common method bias does distort results, it may then distort theory building (Reio, 2010).

The reader can pursue a full exposition of possible solutions to the common method bias issue in sources such as Donaldson & Grant-Vallone (2002), Podsakoff et al. (2003 & 2012) and (Reio, 2010). In summary, these include several *methodological* solutions, mostly involving separation of measurement. Specifically, separating the sources of outcome and predictor variable data is most desirable (e.g. gathering data on small business success outcomes from a different source – say accounting statements – than the source from which predictor variables are gathered). Researchers can also make gains by gathering outcome and predictor variables at different time periods, places, through different surveys or methods, by use of varied answer formats, and by counterbalancing question order. Ensuring anonymity and the like helps to ameliorate anxiety that may color all data, and ensuring clarity and neutrality of question and answer formats helps to avoid underlying confusion or social desirability.

In addition to methodological solutions, statistical solutions are available (see above references). Theoretically, multi-trait multi-method methods are best, but these tend to be available and practical only in scale validation exercises. Certainly, when perceptual methods predominate, at the least researchers should rule out the possibility that all measures (perhaps in a subset) are really measuring a single latent factor – this is referred to as Harmon's single factor test and is usually tested by showing bad fit for a single latent factor underlying all manifest variables in a confirmatory factor analysis (Podsakoff et al.,

2003). This, however, is a weak test that can only provide an initial indication of a problem without providing a solution (although good fit for a single latent factor would probably indicate a substantial methodological problem).

Among other intermediate models that can provide partial solutions, Podsakoff et al. (2003 & 2012) suggest various solutions. The researcher can extract a large first eigenvector in an exploratory factor analysis, explicitly measure and control for a known common method issue (such as explicitly measuring social desirability and controlling for it), and – probably most feasible and balanced – model path relations between constructs while simultaneously modelling a common latent variable loading on all manifest variables (or at least those in a logical subset). The latter would normally involve a simple application of latent variable structural equation modelling. Various other models do exist.

As an illustration of the issue, but also of possible constructive remedies, consider that Farrington's (2012) study utilises a one-shot one-source survey to business owners. It uses a single answer format (a 1-5 point Likert scale) and does not seem to counterbalance questions. This study would seem widely open to common method bias issues, as indeed noted by Farrington (2012:396) in her limitation. Few South African business researchers, including the current author, could claim not to have engaged in such research.

While I would advocate for partial amelioration of the issue through more varied methodologies as described briefly above, in absence of these researchers should at least explicitly rule out a single factor that could perhaps indicate overwhelming commonality. While Farrington (2012:389-390) reports an exploratory factor analysis, she does not report eigenvalues that could be indicative. Given that pre-chosen subscales were chosen, confirmatory factor analysis should probably have been chosen in any event.

As stated above, a more remedial solution may also be desirable. To illustrate this, I employ the 'Common Methods Variance' methodology of Podsakoff et al. (2003) for dealing with common method bias, namely by adding a latent factor underneath all the major manifest indicators in re-estimating the Farrington (2012) regressions. Initial analysis suggests that the Performance variables have little loading on this common factor, and are removed, whereas Personality variables may benefit from a common method extraction. Surprisingly, as seen in Table 4, although the latent factor withdraws substantial variance from some of the personality indicators it does not change material slopes or outcomes of any of the regressions.

Table 4

Farrington's regressions with common method bias latent factor

	Finance		Growth	
	B	**SE**	**B**	**SE**
Extraversion	.130***	.049	.070	.050
Conscientiousness	.135***	.052	.037	.053
Openness	.139***	.050	.162***	.050
Agreeableness	.031	.050	-.009	.051
Neuroticism	-.027	.051	-.126**	.052
R^2	.076		.061	

Notes as for Tables 2 and 3.

This finding may potentially suggest stability of this model *regardless* of the common method employed by Farrington (2012), which is a positive finding for her research. The point of such an observation, however, is that Farrington could easily have explicitly controlled for at least some common bias in this way, rather than merely acknowledging the problem without a solution.

This article accordingly urges for greater rigor in addressing common method bias. Authors should be required to fulfill Conway and Lance's (2012) recommendations for broad reporting requirements, namely "(a) an

argument for why self-reports are appropriate, (b) construct validity evidence, (c) lack of overlap in items for different constructs, and (d) evidence that authors took proactive design steps to mitigate threats of method effects" (Conway & Lance, 2012:325).

Whether the latter requirements can stop at minimal methodological steps or whether post hoc statistical controls are desired (recommended by those like Podsakoff et al., 2012 and not as supported by others like Conway & Lance, 2012), more explicit reporting will help to elevate the rigor of South African research.

7
Rigor of specification: models, controls and constructs

This article argues for greater rigor in the specification of models and constructs, with specific reference to three points.

7.1 Controls and constructs

The requirement for properly specified construct sets is a well-established methodological concern. Of central concern is, of course, adequate measurement of core predictor and outcome constructs.

Of additional concern in this regard are adequate control variables that can provide the proper contextual background for studies, including but not limited to demographic variables such as age and size of the business and contextual variables such as economic context. Failure to include a properly specified set of constructs may weaken a study substantially, or even render its findings meaningless.

For illustration, Farrington (2012) apparently includes no control variables of any kind in her correlational analyses (she mentions none, and covariances drawn from the correlation matrix and descriptive statistics of the core variables replicate her findings, showing no partialling out of controls). A t-test of outcomes slit by two age categories hardly seems like adequate control.

This is arguably a great weakness. Firm demographics such as size and age have substantial correlation to the crucial performance outcomes (Majumdar, 1997; Brush & Chaganti, 1999; Lundvall & Battese, 2000), therefore variances in this regard should have been explicitly controlled for. In addition, Farrington's (2012) data could not have been gathered long after the worldwide economic collapse of 2008-2009. Variables controlling for economic conditions in each company's particular sector or other context may have helped explain important additional variance in the performance outcomes of the regression. Such omissions may explain weak findings in the core relationships.

In general, South African quantitative research must control as adequately as possible for the many external factors that characterise our complex environment, obviously without engaging in overly complex models that may advance limited increases in explanation at the expense of parsimony.

7.2 More complex modelling possibilities

While simple cross-sectional linear methodologies are common, researchers truly interested in exploring areas such as small business dynamics at a high level of competence may wish to consider more complex and perhaps interesting methodologies.

Times series methodologies, such as panel regression, are particularly desirable in the business context, and perhaps particularly for small business, since organisational performance and other dynamics may fluctuate over time and cross-sectional methodologies are hardly suited to pick up the subtleties of such processes. However, time series data are less available here than in many more advanced economies, and not all research questions suit such methods. For instance, Farrington's (2012) personality study could easily point to the relative stability of personalities as a reason for not bothering with change over time.

Having said this, experimental designs are a far more rigorous methodology that allow for temporal processes but with stringent controls. As one example in the context at hand, researchers could conduct a controlled contrast of business performance with stable owners versus that when business ownership *changes* to someone new, which would provide a natural experiment of the effect of a change or stability of owner personality. This would allow for a far more rigorous examination of

the relationships in Farrington (2012). While I do not claim that such experimental data would be easy to gather, or that cross-sectional data of the Farrington ilk are worthless, these points do illustrate alternative modelling possibilities. The aforementioned experiment would, for instance, help to control against the alternate possibility that certain types of personalities tend to choose certain business options that have variable performance outcomes.

Even if time series methodologies are not available, another possibility is nonlinear modelling. It is rare indeed to see true nonlinear models in South African business research, other than power-type transformations enacted for the purposes of retaining linear modelling convenience. However, non-linear modelling may provide a fecund avenue for more interesting and powerful findings.

As an illustration, perhaps the reason for the small size of Farrington's (2012) effect sizes and squared multiple correlations is the possibility of nonlinear effects in some Personality–Performance relationships (Murphy & Dzieweczynski, 2005; Ones, Viswesvaran, Dilchert, & Judge, 2007). Specifically, inverse curvilinearity may be a possibility for certain relationships, suggested as early as Barrick and Mount (1991) and Murphy (1996).

Recent evidence exists for exactly such hypotheses. For instance, Le, Oh, Robbins, Ilies, Holland and Westrick (2011) find Conscientiousness and Emotional Stability to have curvilinear relationships with various facets of Job Performance. Low levels of Conscientiousness, for instance, leads to issues such as chaotic financial recording, whereas overly high Conscientiousness may hinder flexibility and the like. Ames and Flynn (2007) present evidence that assertiveness may have a negative curvilinear relationship with leadership, since high levels of assertiveness may negatively affect relationships and low assertiveness may stunt the leader's ability to assert him or herself. In groupwork research, Barry and Stewart (1997) find the proportion of relatively extraverted members in teams to be related curvilinearly to task focus and group performance, albeit in a small study. In terms of skills development, Cucina and Vasilopoulos (2004) find nonlinear personality-academic performance relationships, and Vasilopoulos, Cucina and Hunter (2007) find inverse linearity between both Conscientiousness and Emotional Stability on training-based proficiency.

Many academic journals at the highest levels of the management discipline will generally not publish cross-sectional, exclusively linear analysis of one-shot surveys, because of the great potential for spurious effects (such as personality affecting business choice rather than performance per se). I do argue that journals such as SAJEMS may consider following suit, unless truly interesting effects such as the nonlinear are observed. Certainly, more gathering of data observed over time and/or arranged in careful experiments would help to add rigor and validity to the field.

8
Conclusion

To truly match the higher levels of international business research, the management research community of South Africa requires a balanced standard of science that carefully considers the meaning of findings.

This article has argued for several research principles to become greater features of business and management research in South African publishing. These are not an exhaustive list, but their application should lead to more rigorous and internationally acceptable research. First, I urge a careful embedding of research in the literature, with an associated consideration of the uniqueness of research versus the benefit of acknowledging studies as essential replications. Second is the importance of conforming to norms of fit and effect analysis in quantitative studies, without tenuous claims. Third is the possibility of empirical validation against prior research of the same kind, a methodological corollary of the first point. Fourth is the much-needed treatment of common method bias, rather than mere acknowledgement of the problem. Fifth is specification of appropriate control variables for models. Fifth is specification of more rigorous models, such as times series, experimental designs, or nonlinear modelling, which are increasingly the standard of such research and which may uncover more interesting dynamics.

This paper has sought to make specific suggestions and, where possible to actually

illustrate how easy many of these improvements can be. It has done so through critique of a specific contribution, without any real desire to deconstruct that article per se. It is nonetheless a secondary result of this article that Farrington's (2012) results might be interpreted as weak evidence of Personality-Performance links, not seemingly robust evidence as reported by her. In light of similar effect sizes in the bulk of historical findings, and because personality will continue to capture the imaginations of managers and is not negligible, the field needs to move on to exploring more interesting process-based models that explain why, how and when such effects may operate (as also suggested by Barrick, 2005). This article has made specific suggestions for models that may be able to achieve this, notably natural experiments. Whatever the direction, I echo Barrick (2005) in saying "Yes, personality matters: Moving on to more important matters".

In general, it is hoped that these comments may be interpreted as a more general call to greater methodological rigor in fields such as small business research, and that the illustrations given here may show that such enhancements are easily accessible to most researchers.

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