

Predicting performance from personality: Fewer factors produce feebler forecasts

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Summary

The Single Factor of Personality (SFP) is the idea that personality can be summarised most parsimoniously not by 5 big factors, but by the smallest possible number: just one factor. Supporters of the SFP claim it predicts overall work performance. This session presents thorough analyses to see if the SFP lives up to its claims; we investigated whether the SFP, a 5 Factor model, or a 16 Factor model turned out to be a better predictor of work engagement, work performance, salary and promotion.

Introduction and background

Central to Occupational Psychology is the ideal of evidence-based practice. Therefore, when a new theoretical perspective claiming to predict work performance starts to make waves in academia, its practical significance begs investigation. This is the case with the Single Factor of Personality (SFP). It is the idea that personality can be summarised in the most parsimonious way not by five big factors, but by the smallest possible number: just one factor. For this reason, we propose the following presentation for Investing in the Future of Research. It builds upon work first presented to the DOP Conference in 2013, but goes further by exploring multiple datasets and new criteria, including measures of engagement, salary, promotion, and 360 measures of work performance.

The most accepted model of conventional personality theory is the Big Five/Five Factor Model (FFM, McRae & Costa, 1999). Due to observations of inter-correlations among the traits (e.g. Digman, 1997) some researchers have suggested a two-factor structure, for example:

- Alpha/Beta model (Digman, 1997)
- Stability/Plasticity (DeYoung et al, 2001)

Following this reductive trend, researchers have proposed a universal single-factor structure of personality, claiming it predicts overall work performance (The General Factor of Personality, GFP, e.g. Musek, 2007; van der Linden, Nijenhuis, & Bakker, 2010).

Opponents of the SFP point to three major issues:

1. the SFP appears to be due largely to socially desirable responding and thus it tends to diminish significantly in non-applicant samples (as opposed to applicant samples) (Ziegler, 2012)
2. the SFP appears to diminish when problematic questionnaire items are corrected so that they are not disproportionately more attractive to endorse than others (Björklund & Bäckström, 2013)
3. it has been argued that broad descriptors obscure relationships between personality and criterion measures (Hough, 1992). The FFM has been criticised for being too broad to be helpful in understanding behaviour (Block, 1995); therefore the SFP is unlikely to be any better.

With these issues in mind, we decided to evaluate the utility of the SFP to see which structure of personality gives the appropriate level of detail.

Following findings of Judge and Mount (2002), whose Big Five and job satisfaction research showed Anxiety to be a significant predictor of satisfaction, this study looked at the relationship between the SFP and work engagement. Following the claims of SFP supporters, we examined the same for the SFP, Big Five, 16PF scales and work, performance and promotion.

Method

Datasets used

1. UK and Republic of Ireland gender-balanced sample comprising 1,212 individuals representative of the UK/IE working population (for age, region, ethnic background, etc.). Data was collected for research purposes. This group completed the 16PF5 and a battery of self-reported criteria questions including work outcomes
2. UK personnel sample, comprising 63,921 individuals who completed the 16PF5 for a variety of recruitment and development activities
 - a. gender-balanced UK personnel sample, with 15,000 males and 15,000 females randomly selected from the UK personnel sample
3. US dataset from the US 16PF website, comprising 30,567 individuals who had completed the 16PF5 for a variety of recruitment and development activities
4. US manager dataset, comprising 279 individuals on a management course who completed the 16PF5 and the Benchmarks 360 assessment of competencies and derailers.

Analysis

Multiple analyses were conducted:

- PCA Exploratory Factor Analysis of the UK Standardisation sample, UK personnel sample and gender-balanced UK personnel sample to look for the SFP
- bivariate correlations to look at which 16PF questions and personality factors were most strongly correlated with Impression Management (IM) in the UK standardisation sample (IM is the 16PF's Social Desirability scale)
- the 16PF was split in half to create a 'Socially Desirable' version of the 16PF containing the questions most correlated with factor IM and a 'Socially Ambivalent' version of the 16PF containing those that correlated least. These were analysed using PCA Exploratory factor Analysis
- linear multiple regression analyses to look for relationships between personality models and IM with work performance and engagement.

Results

The following observations were found:

Factor analysis across all datasets found that a 2 factor model had the best fit to the data, not a single factor. These 2 factors are unlike previous models (Alpha/Beta or Plasticity/Stability). Extraversion and Independence load positively and strongly onto Factor 1 as well as Tough-mindedness in the negative direction. Tough-

mindedness also loaded strongly but positively onto Factor 2 as well as negative Anxiety and positive Self-Control.

The Factor Analysis was repeated with IM added, but a SFP still did not emerge.

We considered that perhaps the SFP may only emerge when only the items most closely related to IM were selected for analysis. Even with the 16PF split into halves for Social Desirability, a single factor structure was not found in either half. Two factors emerged, accounting for 65% of the variance.

Regression analysis with the standardisation sample showed that IM was a significant predictor of Engagement at Work ($R = .252, p < .001$) but was not a significant predictor of salary or promotion. Further, in the Benchmarks dataset IM was found not to correlate with ratings of work performance from an individual themselves, their boss, peers or their direct report.

Regression analyses were conducted to determine which model of personality provided the best predictive model of performance in the workplace. A 2 factor model ($R = .151$), 5 factor model ($R = .252$) and 16 factor model ($R = .312$) all significantly predicted salary ($p < .001$). The 5 factor model also significantly predicted self rating of performance ($R = .234, p = .009$) and peer rating of performance ($R = .213, p = .026$). However, the 16 factor model predicted both self rating of performance ($R = .359, p = .002$), peer rating of performance ($R = .346, p = .006$) and additionally boss rating of performance ($R = .344, p = .008$), explaining a greater percentage of the variance than the 5 factor model did.

The same pattern was found in regressions predicting engagement at work from personality. The 2 factor model ($R = .291, p < .001$) and 5 factor model ($R = .295, p < .001$) explained less variance than the 16 factor model ($R = .348, p < .001$). The overall finding across our data shows that the more factors that are used as predictors, the greater the percentage of variance explained.

Discussion

The lack of an overall single factor of personality in the 16PF contradicts the idea that there is a universal Single Factor of Personality. If one exists, it should occur universally.

It is our view that the SFP does not occur in the 16PF as the questions ask respondents to choose between two bi-polar ends of a 3-point Likert scale; both sides of response options are designed to be appealing, so may reduce the influence of social desirability in responding (e.g. to say if they would prefer to be an architect or a counsellor).

With regards to Social Desirability, adding IM into the factor model did not provide any additional 'glue' to bind the factors into one SFP. Additionally, IM in itself does not predict job performance.

Instead (unsurprisingly) traits desirable to the workplace lead to better predictions of ratings of performance, salary and engagement. The desired traits appear to be Extraversion, Independence (less agreeable), Tender-mindedness (more openness to new experience), less Anxiety, and more Self-control (Conscientious). All of these are more socially desirable (with the exception of Independence which is desirable for success, rather than socially desirable); however, the traits are more predictive than Social Desirability itself.

The study also showed increased predictive power when using more granular personality data. Two Factor and Five Factor Models are much worse predictors (when it comes to critical metrics such as boss rating of performance, both models were not even significant).

Conclusion

In research, the use of broad factors is convenient, but damaging to the profession – it underestimates the relevance of personality to crucial real-world outcomes (such as job performance and engagement). This in turn is likely to lead to diminished credibility of work-place use of psychology and psychometrics.

If researchers wish to use the Big Five to employ a common language, that is understandable, but we assert that they should collect data with any of the many good measures that use more detailed subscales within the Big Five.

In practice, use of broad factors in recruitment situations is unforgiveable. Broad factors may play a role in self-development applications where simple summaries help individuals to explore and remember their main personality traits. However, when it comes to high-stakes decisions over the careers of individuals and the future of organisations, there is no excuse for using broad measures of personality, given that more specific and more accurate ones are widely available. The predictive power of personality is not in broad/generic concepts, but in the specifics.

Additional information

Innovation and interest to the public and attendees:

People are likely to be concerned about the idea that personality could be reduced down to one single factor – implying that any individual could be judged according to just one ‘score’. Studies focusing on broad factors have dominated personality research; it is less usual to see mapping of specific personality factors to discrete job criteria.

References

- Block, J. (1995). A contrarian view of the five-factor approach to personality description. *Psychological Bulletin*, 117, 187-215.
- Björklund, F. & Bäckström, M. (2013) *Social desirability in personality inventories: The nature of the evaluative factor*. Unpublished paper at the European Congress of Psychology conference, Stockholm.
- DeYoung, C.G., Peterson, J.B., & Higgins, D.M. (2002). Higher order factors of the big five predict conformity: Are there neuroses of health? *Personality and Individual Differences*, 33(4), 533-552.
- Digman, J.M. (1997). Higher-order factors of the Big Five. *Journal of Personality and Social Psychology*, 73, 1246-1256.
- Hough, L. (1992). The "Big Five" personality variables – construct confusion: Description versus prediction. *Human Performance*, 5, 139-155.
- Judge, T.A., Heller, D. and Mount, M.K. (2002) Five-Factor Model of Personality and Job Satisfaction: A Meta-Analysis. *Journal of Applied Psychology*, 87 (3), 530-541.
- McCrae, R.R., & Costa, P.T. Jr. (1987). Validation of the Five Factor Model of personality across instruments and observers. *Journal of Personality and Social Psychology*, 52(1), 81-90.
- Musek, J. (2007). A general factor of personality: Evidence of the Big One in the Five Factor model. *Journal of Research in Personality*, 41, 1213-1233.

van der Linden, D., Nijenhuis, J., Bekker, A.B. (2010). The General Factor of Personality: A meta-analysis of Big Five inter-correlations and a criterion-related validity study. *Journal of Research in Personality*, 44, 315-327.

Ziegler, M. (2012) *Social Desirability and the Single Factor of Personality*. Unpublished conference presentation at the International Test Commission conference, 2012, Amsterdam.