whitepaper

OPP
unlocking potential

Using broad or narrow personality measures to predict leadership success: does keeping it simple have an impact on predictive power and utility?

Anne Herrmann, OPP Ltd

Synopsis

This White Paper sets out the arguments for using broad or narrow personality traits to predict leadership success. It includes a summary of the Five-Factor Model, highlights limitations of using the model and considers specific practical considerations for researchers and practitioners when choosing whether to take a broad or narrow approach when measuring personality. The empirical study described in this paper demonstrates the superiority of specific personality measures (ie Primary Factors) over broad personality measures (ie Global Factors). In summary, keeping it simple does have a negative impact on predictive power and utility, as well as on value to the respondent. The optimum approach for researchers and practitioners is to assess personality by using narrow trait measures.

Background: using personality to predict leadership success

Personality as a predictor of behaviour and performance in the workplace has been of great interest to researchers and practitioners alike and has been investigated in great detail[1]. There is strong consensus that personality is a relevant predictor of successful leadership[2]. Being able to predict leadership success is of interest because research provides evidence that managers not only contribute directly to the overall performance of an organisation but also impact indirectly as their personality influences the performance of those reporting directly to them[3]. Most studies that use personality as a predictor of job performance have focused on the Five-Factor Model (FFM) as a framework to account for individual trait differences[4].

This White Paper compares the predictive power of the Five-Factor Model with a more detailed assessment of personality with regard to leadership success, and evaluates the usefulness of using broad or narrow traits for practitioners in their work with leaders.

About the Five-Factor Model of personality

Description of a Five-Factor Model

Personality has been described using different levels of detail. One commonly used approach is the 'Five-Factor Model' or the 'Big Five Model'. It assesses personality using five broad dimensions that have been agreed on by many researchers. These five broad factors as described by the three most well-known Five-Factor Model approaches are presented in Table 1. The three approaches agree not only with regard to the numbers of dimensions used to describe personality but also – at least in general – with regard to the nature of the five constructs measured.

Benefits of using a Five-Factor Model

The Five-Factor Model has been promoted for various reasons:

- It brings "orderliness to a field long in need of one"[5].

- Results from different studies can be compared or aggregated using meta-analysis[6].

- It can be considered as a 'common language' when describing personality because there is a high level of agreement between researchers over the years concerning the number of factors constituting personality and also a fair level of agreement concerning the nature of the constructs measured[7] (as seen in Table 1).

---

[1] For a review see Goodstein & Lanyon, 1999.
[2] eg, Bradley, Nicol, & Charbonneau, 2002; Church & Waclawski, 1998; Judge & Bono, 2000.
[3] Kickul & Neuman, 2000.
[4] eg, Barrick & Mount, 1991; Gellatly & Irving, 2001; Judge & Bono, 2000.
[5] Digman, 1989, p.98.
[6] eg, Barrick & Mount, 1991; Hurtz & Donovan, 2000; Judge, Bono, Ilies, & Gerhardt, 2002; Salgado, 1997; Tett, Jackson & Rothstein, 1991.
[7] eg, Cattell, 1957; Digman, 1989; Goldberg, 1990; McCrae & Costa, 1985; Norman, 1963.

Table 1: Summary of the alignment between three widely used measures of personality using the Five-Factor Model[8]

Global Factors of the 16PF questionnaire (Cattell)	Domain scales of the NEO PI-R (Costa & McCrae)	Personality factors of the Big Five Model (Goldberg)
Extraversion/Introversion	Extraversion	Surgency
Low Anxiety/High Anxiety	Neuroticism	Emotional Stability
Tough-Mindedness/Receptivity	Openness	Intellect or Culture
Independence/Accommodation	Agreeableness	Agreeableness
Self-Control/Lack of Restraint	Conscientiousness	Conscientiousness or Dependability

The similarities between models proposed by different researchers using different instruments has led to a general acceptance of the Five-Factor Model of personality. The replication of these five factors by different researchers over time and across cultures provides further evidence for the relevance of this model in the description of personality[9]. In addition, although there is some disagreement between the exact definitions of the five broad factors, these seem negligible in light of the disagreement surrounding describing personality using specific scales[10]. For example, although both the 16PF® questionnaire and the NEO PI-R measure five fairly similar broad factors, the way in which they describe personality using narrow traits differs considerably with regard to: (1) the approach that is used (ie how the narrow traits are mapped onto the broad factors), (2) the number of these scales and (3) the content of these narrower constructs.

Limitations and drawbacks of using a Five-Factor Model

Based on the information presented so far, it appears that using five factors when describing personality is a convincing approach. However, there are several drawbacks, not only conceptually, but also in terms of utility for researchers and practitioners.

- **Lack of agreement between different Five-Factor Models:** Although the clear one-to-one mapping shown in Table 1 suggests a high level of agreement between the three approaches, there are considerable differences. The most obvious difference is in the naming of the five personality factors. This is, among other reasons, partly due to the use of one or other pole of these bipolar constructs when labelling the factor and partly due to a different focus in terms of the definition of the constructs that each broad factor measures. Practitioners therefore need to be aware that even when these five personality factors appear comparable and although they are often treated as similar, there are still some differences on the more detailed level. For example, the broad factor Independence based on Cattell's model[11] is described by the more specific traits Vigilance, Social Boldness, Dominance and Openness to Change. In comparison, the matching broad factor Agreeableness from the NEO PI-R[12] is made up of the narrow traits Trust, Straightforwardness, Compliance, Altruism, Modesty and Tender mindedness. Using these narrow traits to describe the constructs measured by the broad factors demonstrates that although the Five-Factor Model provides a common framework, there are substantial differences between apparently similar broad factors in both definition and focus of the constructs measured.

- **Too broad to be useful in describing personality:** When using personality questionnaires, researchers as well as practitioners need to consider what level of detail – broad versus narrow dimensions – is required when assessing and describing the constructs adequately. One phenomenon frequently referred to when discussing the benefits and shortcomings of using either broad or narrow descriptions of traits is the **'bandwidth fidelity dilemma'**[13]. 'Bandwidth' refers to the ability to view psychological constructs using a wide-angle lens and consequently understand the 'big picture'; however, using this approach also implies a loss of detail. 'Fidelity', on the other hand, refers to the ability to define aspects of personality precisely, so providing a more detailed view by 'zooming in'. However, this results in less resonance with broader themes or criteria. Practitioners as well as researchers are faced with this dilemma when deciding whether to use narrow versus broad scales in the description of personality traits.

---

[8] Table amended from Cattell & Mead, 2008.
[9] Rolland, 2002; Schmitt, Allik, McCrae, Benet-Martinez, et al., 2007.
[10] Roberts, Chernyshenko, Stark & Goldberg, 2005.
[11] Conn & Rieke, 1994.
[12] Costa & McCrae, 1985.
[13] Cronbach & Gleser, 1965.

o For the **practitioner**, this decision has implications for the interpretation of the results, both when gaining an understanding of the respondent's personality and when reporting back the findings to the respondent. Using narrow dimensions in the description of personality is beneficial for the practitioner for several reasons:

- Narrow descriptors of personality have been found to offer deeper insights into an individual's personality and offer greater 'psychological meaningfulness'[14]. On the other hand, broad dimensions as used by the Five-Factor Model of personality have been criticised for being too broad to be helpful in understanding behaviour[15].

- A more detailed assessment of personality using narrow traits provides the practitioner with more depth of information and also with the opportunity to *interpret the interaction* of different personality traits. This is an important and fruitful source of insight which supports highly nuanced and resonant feedback.

- A more detailed and specific description of an individual's personality will provide practitioners with more relevant information on likely respondent *behaviours*. For example, assessing the level of Extraversion (one of the Global Factors of the 16PF questionnaire, see Table 1 and the Appendix) of an individual may be useful. However, to predict how an individual behaves in social situations, measures of Social Boldness, Warmth, Liveliness, Privateness and Self-Reliance (the five contributing Primary Factors of Extraversion) will yield more insight. They better capture the idiosyncratic nature of what makes an individual who they are. Armed with these in-depth descriptions of an individual's personality, the practitioner can support the individual more effectively in their career development, based on the findings of the personality assessment.

However, there are also some disadvantages for the practitioner when using narrower descriptions of personality. Using narrower descriptions leads to a larger number of scales, resulting in more detailed information. This can leave the respondent confused and overwhelmed during and after the feedback session. For a layperson (eg the assessed individual or their manager) the information may be more easily accessible when personality is described in broader terms based on the Five-Factor Model.

o For the **researcher**, the decision to use broad or narrow personality descriptors will impact on the results that are found when investigating the relationships between personality traits and other criteria. There are several reasons why using narrow factors may be better:

- Hough argues that broad descriptors, eg as in the Five-Factor Model, obscure relationships between personality and criterion measures[16]. This view has been supported by empirical evidence from different studies in which stronger relationships were found between specific variables than between broad measures[17]. One study using the 16PF questionnaire demonstrated that the Primary Factors accounted for significantly more variance in real-life data (such as pay, tenure, supervisor's ratings) than Global Factors[18].

- Due to the broad definitions of the dimensions in the Five-Factor Model, the potential insights gained from research studies on the relationship between personality and leadership are rather limited, because any links found between both constructs would provide only fairly general information on which traits might be relevant for a leader to be successful[19]. Given that each broad personality dimension incorporates a wide range of specific traits, the findings do not shed much light on which *particular behaviours* are related to successful leadership and are therefore of little utility for practitioners.

However, using a more detailed assessment of personality, ie a higher number of scales, has its downsides for the researcher, too. Narrower traits are usually assessed with fewer items, resulting in lower reliabilities of these scales. This in turn will limit the size of the correlations found and consequently will underestimate the link between personality and other criteria. Furthermore, correlating a high number of personality scales with other measures increases the likelihood of randomly significant results that are not conceptually meaningful. To prevent this,

---

[14] Paunonen, Rothstein & Jackson, 1999.
[15] Block, 1995.
[16] Hough, 1992.
[17] Ashton, 1998; Tett, Steele, & Beauregard, 2003.
[18] Mershon & Gorsuch, 1988.
[19] Judge, Bono, Ilies, & Gerhardt, 2002.

the significance levels can be adjusted accordingly. However, the researcher then needs to work with larger samples to obtain significant results in the analysis. These arguments demonstrate that the 'bandwidth fidelity dilemma' plays an important role in research on the predictive power of an instrument, and it is clear that there is no straightforward answer.

So, there are arguments for both narrow and broad measures, and the 'bandwidth fidelity dilemma' cannot be resolved easily. Therefore, a pragmatic approach is needed, in which the utility for researchers as well as practitioners is assessed to determine whether to use broad or narrow descriptors of personality traits. The usefulness of personality instruments in occupational settings could be said to depend on its predictive power related to relevant criteria (work performance, leadership, etc) and its ability to provide the practitioner with a better understanding of the links between personality and behaviour.

Objective of the empirical study: assessing the value of broad or narrow measures in predicting leadership success

An empirical study was conducted in order to assess the value of using the Five-Factor Model of personality versus narrow measures in the prediction of leadership success. Given the virtues of simplicity, it could be argued that fewer factors would be preferable when describing psychological constructs such as personality. However, while simplicity has its advantages, particularly from the point of view of the line manager or those newer to psychology, simplicity should not be aimed for at the expense of usefulness for the practitioner. In the case of describing the relationship between personality and leadership, the utility for practitioners should be considered with regard to two aspects:

(1) the predictive power of personality for leadership success, and

(2) the benefit that is gained for the practitioner (and for leaders) from knowing about the specific relationships between certain factors of personality and leadership behaviour.

This White Paper addresses both aspects by not only reporting the results of an empirical study but also discussing how these findings may be used by practitioners in their day-to-day work with leaders.

Design and methods of the empirical study

In the study, both constructs – personality and leadership skills – were assessed using narrow traits.

The questionnaires

- The personality instrument used in this study was the 16PF® 5th Edition Questionnaire[20]. The 16PF questionnaire is an ideal tool with which to investigate the value of using narrow versus broad measures of personality as it assesses each construct using narrow trait definitions (Primary Factors) as well as broad descriptors (Global Factors).

- The leadership assessment tool used was the Benchmarks® instrument[21], a 360-degree tool which provides a comprehensive measurement of leadership skills for experienced managers. The part of the Benchmarks instrument that was used in this study measures leadership skills in the following three areas: (1) Meeting Job Challenges, (2) Leading People and (3) Respecting Self and Others. These three areas are based on self-ratings using 115 items that constitute 16 scales, eg 'Resourcefulness', 'Decisiveness' and 'Building and Mending Relationships'.

Data collection

In order to demonstrate the value for practitioners of using Primary versus Global Factors in the application of the 16PF questionnaire, its relationship with Benchmarks was examined. For this purpose, data were collected from 279 managers who attended five-day leadership development programmes at the Center for Creative Leadership (CCL) between April and December 2006. As part of the leadership development programme, managers rated their own leadership behaviours by completing the Benchmarks questionnaire. After attending their respective leadership development programmes, managers were invited to fill out the 16PF questionnaire online. Of the 279 managers who volunteered to participate in this study, 58% were male, 81% were white, 49% were upper-middle-level managers, 88% worked in the private sector and 45% had a minimum of a bachelor's degree. The participants came from more than 240 different organisations.

---

[20] R. B. Cattell, A. K. Cattell, & H.E. P. Cattell, 1993; Conn & Rieke, 1994.
[21] Lombardo, McCauley, McDonald-Mann, & Leslie, 1999.

4

Analysis

Multiple regression analyses were performed separately for eight of the 16 leadership skills[22] using personality traits as predictors. To investigate the nature of the relationship between 16PF results and managerial performance as assessed by the Benchmarks scales, each of these analyses was run twice, first using personality at Global Factor level as a predictor, and second using personality at Primary Factor level as a predictor. In order to compare the predictive power of Global versus Primary Factors directly, it was decided to map only the Global Factors onto the eight leadership skills and enter them into the analysis accordingly. In the subsequent second analysis using the narrow traits, the Primary Factors that constitute the previously identified Global Factors were included in the analysis. For example, if Extraversion was defined a priori as a relevant predictor for the leadership skill 'Building and Mending Relationships', then its constituent Primary Factors (Warmth, Social Boldness, Liveliness, Privateness and Self-Reliance) were entered into the second analysis.

Results

A comparison of the results from the analyses on both levels indicates that the explained variances[23] obtained for the prediction of the eight leadership competencies were higher in six cases when using Primary Factors than when using Global Factors. *On average, 32% more variance was explained when using narrow trait descriptions provided by the Primary Factors.* What this means is that the Primary Factors were more powerful predictors of leadership behaviour than the more general Global Factors.

Higher predictive power from narrow personality measures

For example, the Benchmarks leadership skill 'Decisiveness' was predicted to be related to the two Global Factors Anxiety (AX, negative relationship) and Independence (IN). These two predictors were entered into the first analysis. For the second analysis, the contributing Primary Factors [Emotional Stability (C), Vigilance (L), Apprehension (O), Tension (Q4), Dominance (E), Social Boldness (H) and Openness to Change (Q1)] were included. As shown in Table 2, 8% of the variance was explained using the Global Factors as predictors but nearly twice as much (15%) using the Primary Factors. In the first analysis, Anxiety was identified as a relevant predictor for the leadership skill 'Decisiveness'. In practice, this means that leaders with lower anxiety are likely to have less difficulty when making decisions and may come across as more decisive. In the second analysis, the Primary Factors Tension (Q4), Dominance (E), Apprehension (O−) and Emotional Stability (C) were found to be relevant predictors of the criterion 'Decisiveness'. For the practitioner, this means that an exploration may be useful of how the leader's behaviour with regard to these four aspects of personality may impact on how he or she is perceived with regard to their 'Decisiveness'.

More meaningful results for practitioners...

However, as already discussed, it is helpful to compare not only the predictive power of either broad or narrow personality measures, but also the utility and meaningfulness of the results for practitioners. The following example demonstrates how the results of the study based on Global vs Primary Factors can be used by the practitioner.

The Benchmarks leadership skill 'Doing whatever it takes' was predicted to be related to the two Global Factors Independence (IN) and Extraversion (EX). So whereas these two predictors were entered into the first analysis, for the second analysis their contributing Primary Factors [Warmth (A), Liveliness (F), Social Boldness (H), Privateness (N), Self-Reliance (Q2), Dominance (E), Vigilance (L) and Openness to Change (Q1)] were included. For the first analysis, only Independence (IN) was identified as a relevant predictor for the leadership skill 'Doing whatever it takes'. For the second analysis, the two Primary Factors Dominance (E) and Social Boldness (H) were shown to be relevant predictors. The two analyses yielded similar results (13% vs 14% explained variance, see Table 2 for details), showing that in this instance, broad and narrow measures of personality did not differ with regard to their predictive power.

---

[22] These eight leadership skills were selected because for these skills it was hypothesised that there would be clear relationships with personality.

[23] This is equivalent to the Adjusted R-square value that is provided in a multiple regression analysis as a measure of the predictive value of the predictors. It indicates the amount of variance in the criterion (in this case a specific leadership skill) that is accounted for by the predictors (in this case personality factors).

Table 2: Results of multiple regression analysis for 16PF factors predicting Benchmarks leadership skills (examples)

Leadership skill	Predictors: Global Factors				Predictors: Primary Factors			
	R	Explained variance (adjusted)	Predictors entered	Predictors included	R	Explained variance (adjusted)	Predictors entered	Predictors included
Doing whatever it takes	0.370	13%	IN, EX	IN+	0.387	14%	E, H, L, Q1, A, F, N, Q2	E+, H+
Decisiveness	0.287	8%	IN, AX	AX−	0.407	15%	E, H, L, Q1, C, O, Q4	Q4+, E+, O−, C+

(+) indicates a positive relationship between the predictor and the criterion; (−) indicates a negative relationship between the predictor and the criterion.

However, in terms of the usefulness of this study for the practitioner, it is clear that the results based on the second analysis are more meaningful. Using Global Factors, the practitioner would only know that a leader's score on Independence (ie to what extent he or she is prepared to influence others and pursue their own ideas) has been shown to have an impact on the leadership skill 'Doing whatever it takes'. In comparison, feedback on somebody's personality and its influence on leadership behaviour become far more meaningful and relevant when the practitioner can relate the leader's expressed Dominance (E) and Social Boldness (H) to that person's behaviour at work.

… to support better development outcomes for respondents

In this case, the practitioner can explore how these two specific aspects of personality will impact on the leader's skill to 'do whatever it takes'. The first aspect to investigate would be Dominance, which describes how forceful the leader is in pursuing his or her ideas and getting things done in their way. This will provide an indication of the leader's preparedness to defend his or her priorities, particularly in the face of difficulties. For example, if a leader is very deferential (ie has a low score on Dominance), he or she may struggle to make things happen as a result of the tendency to avoid conflicts that may arise in the process. The second aspect of personality that impacts on a leader's ability to 'do whatever it takes' – based on this empirical study – is Social Boldness. When the practitioner provides the leader with feedback on his or her personality, it may be useful to explore how confident the leader feels in dealing with other people. Conveying confidence in social situations is important when communicating with others what needs to be done and in getting their buy-in.

Apart from these practical benefits, there is something else to consider in the discussion of broad versus narrow measures, explained using the example above. Both Dominance and Social Boldness are contributing Primary Factors to the Global Factor Independence. The approach to the analysis in this study also allows us to see that *only* these two aspects of the broad dimension Independence are relevant for the leadership skill 'Doing whatever it takes'. The other two Primary Factors belonging to Independence [Vigilance (L) and Openness to Change (Q1)] have not been identified as significant predictors in the second analysis. In other words, although Independence has been shown to be a significant predictor on the broad factor level, the second analysis demonstrated that not all aspects of this Global Factor are related to the leadership skill. This means that when coaching a leader on 'Doing whatever it takes', the practitioner does not need to include the Primary Factors Vigilance or Openness to Change in the discussion and can instead focus on the two Primary Factors that have been identified as relevant (Dominance and Social Boldness). As a result, the intervention with the leader will be much more precise and a more impactful conversation can take place.

As the example above demonstrates, understanding the relationship between the leadership skill 'Doing whatever it takes' and Independence may be useful to obtain a general understanding of the nature of leadership and its relationship with personality. However, it is the link between certain Primary Factors, in this case Dominance and Social Boldness, and leadership that allows the practitioner to be more specific about what is required and the individual's ability to succeed as a leader. Even in cases where the predictive power is not different between broad and narrow personality measures, there are still significant practical advantages of using more fine-grained measures of personality. Practitioners can use their knowledge of links between specific traits and leadership competencies based on empirical research more easily, for example in the application of personality assessment in leadership coaching, leading to more effective coaching interventions – and, ultimately, better organisational outcomes.

Conclusions: what does this mean for practitioners, researchers and leaders themselves?

Detailed descriptors of personality enable practitioners to get an in-depth understanding of an individual's preferred behaviours and to investigate potential interactions that may exist between different personality traits. They also enable the practitioner to explore – together with the respondent – the link between certain aspects of personality and their impact on leadership success. This is of great value as increased awareness of one's personal style is an absolutely necessary step towards leadership development and enhanced performance.

With regard to empirical considerations, the study has shown that higher correlations, ie clearer links, between personality and leadership were found when using Primary Factors rather than Global Factors. This may also be due to the fact that the criterion – leadership skills – was assessed at the same level of specificity by Benchmarks as was personality by the 16PF Primary Factors, hence providing a good 'match' between the predictor and the criterion variables, which has been considered as important in order to maximise predictive power[24].

Over and above these conceptual arguments and empirical evidence, we should add that the other key consideration around the value of detail is the knowledge and skill of the person using the results of the personality assessment; the expertise of the user will naturally influence what level of detail is desired[25] and how far complexity adds value. Whereas the trained practitioner will appreciate the amount and depth of information provided by a fine-grained assessment of personality, this could be fairly overwhelming for the respondent. A sound approach is to use the Five-Factor Model as an organising principle when sharing the results of the personality assessment with the respondent but help him or her to benefit from the more specific information provided by the Primary Factors when reflecting on their personality and relating these traits to their behaviour and success at work.

To summarise, the **optimum approach** – based on empirical as well as practical considerations – is to assess personality for the purpose of understanding leadership behaviour with **narrow trait measures** *without dismissing* the information that can be provided by the broad dimensions. The Five-Factor Model can be used to gain an overall picture of the respondent's personality (by looking at the Global Factor scores) and as an organising principle when presenting the results to the respondent (by feeding back the results of the Primary Factors as mapped onto the Global Factors). As the Primary Factors lend themselves more to being related to specific behaviour, they will be more useful when exploring the results with the respondent.

Given that the 16PF questionnaire offers both specific descriptions using Primary Factors and broad descriptions using Global Factors, it is the ideal instrument to deliver the best of both worlds.

Interested in learning more?

For more information on using personality to predict leadership success, visit http://www.opp.eu.com or contact us on +44 (0)845 603 9958.

For technical support for existing OPP products, contact client services on +44 (0)845 603 9958.

---

[24] Tett, Steele, & Beauregard, 2003.
[25] Hampson, John, & Goldberg, 1986.

References

Ashton, M. C. (1998). Personality and job performance: The importance of narrow traits. *Journal of Organizational Behavior*, 19(3), 289–303.

Barrick, M. R., & Mount, M. K. (1991). The big five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44, 1–26.

Block, J. (1995). A contrarian view of the five-factor approach to personality description. *Psychological Bulletin*, 117, 187–215.

Bradley, J. P., Nicol, A. A. M., & Charbonneau, D. (2002). Personality correlates of leadership development in Canadian forces officer candidates. *Canadian Journal of Behavioural Science*, 43(2), 92–103.

Cattell, R. B. (1957). *Personality and motivation structure and measurement.* New York: World Book Co.

Cattell, H.E.P. & Mead, A.D. (2008). The Sixteen Personality Factor Questionnaire (16PF®). In G. J. Boyle, G. Matthews and D. H. Saklofske (Eds.), *Handbook of Personality Theory and Testing*. London: Sage.

Cattell, R. B., Cattell, A. K. & Cattell, H. E. P. (1993). *Sixteen Personality Factor Questionnaire*, fifth edition. Champaign, IL: Institute for Personality and Ability Testing.

Church, A. H., & Waclawski, J. (1998). The relationship between individual personality orientation and executive leadership behavior. *Journal of Occupational and Organizational Psychology*, 71, 99–125.

Conn, S. R., & Rieke, M. L. (1994). *The 16PF® Fifth Edition Technical Manual*. Champaign, IL: Institute for Personality and Ability Testing, Inc.

Costa, P.T., & McCrae, R.R. (1985). *The NEO PI-R Personality Inventory manual.* Odessa, FL: Psychological Assessment Resources, Inc.

Cronbach, L. J., & Gleser, G. C. (1965). *Psychological Tests And Personnel Decisions* (2nd ed). Urbana, IL: University of Illinois Press.

Digman, J. M. (1989). Five robust trait dimensions: Development, stability, and utility. *Journal of Personality*, 57, 195–214.

Gellatly , I. R., & Irving, P. G. (2001). Personality, autonomy, and contextual performance of managers. *Human Performance*, 14(3), 231–245.

Goldberg, L. R. (1990). An alternative "description of personality": The big-five factor structure. *Journal of Personality and Social Psychology*, 59, 1216—1229.

Goodstein, L. D., & Lanyon, R. I. (1999). Applications of personality assessment to the workplace: A review. *Journal of Business and Psychology*, 13(3), 291–322.

Hampson, S.E., John, O.P., & Goldberg, L.R. (1986). Category breadth and hierarchical structure in personality: Studies of asymmetries in judgments of trait implications. *Journal of Personality and Social Psychology*, 51, 37–54.

Hough, L. (1992). The "Big Five" personality variables – construct confusion: Description versus prediction. *Human Performance*, 5, 139–155.

Hurtz, G. M., & Donovan, J. J. (2000). Personality and job performance. *Journal of Applied Psychology*, 85, 869–879.

Judge, T. A., & Bono, J. E. (2000). Five-factor model of personality and transformational leadership. *Journal of Applied Psychology*, 85(5), 751–765.

Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology*, 87(4), 765–780.

Kickul, J., & Neuman, G. (2000). Emergent leadership behaviors: The function of personality and cognitive ability in determining teamwork performance and KSAs. *Journal of Business and Psychology*, 15(1), 27–51.

Lombardo, M.M., McCauley, C.D., McDonald-Mann, D., & Leslie, J.B. (1999). *Benchmarks Developmental Reference Points*. Greensboro, NC: Center for Creative Leadership.

McCrae, R. R., & Costa, P. T., Jr. (1985). Updating Norman's "adequate taxonomy": Intelligence and personality dimensions in natural language and in questionnaires. *Journal of Personality and Social Psychology*, 49, 710–721.

Mershon, B. & Gorsuch, R.L. (1988). Number of factors in the personality sphere: Does increase in factors increase predictability of real-life criteria? *Journal of Personality and Social Psychology*, 55(4), 675–680.

Norman, W. T. (1963). Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. *Journal of Abnormal and Social Psychology*, 66, 574–83.

Paunonen, S. V., Rothstein, M. G. & Jackson, D. N. (1999). Narrow reasoning about the use of broad personality measures for personnel selection. *Journal of Organizational Behavior*, 20(3), 389–405.

Roberts, B.W., Chernyshenko, O.S., Stark, S., & Goldberg, L.R. (2005). The structure of conscientiousness: An empirical investigation based on seven major personality questionnaires. *Personnel Psychology*, 58, 103–139.

Rolland, J.-P. (2002). The cross-cultural generalizability of the Five-Factor Model of personality. In R. R. McCrae & J. Allik (Eds.), *The Five-Factor Model of Personality across Cultures* (pp. 7-28). New York: Kluwer Academic/Plenum Publishers.

Salgado, J. F. (1997). The five factor model of personality and job performance in the European Community. *Journal of Applied Psychology*, 82, 30–43.

Schmitt, D.P., Allik, J., McCrae, R.R., Benet-Martinez, V., et al. (2007). The geographic distribution of Big Five personality traits: patterns and profiles of human self-description across 56 nations. *Journal of Cross-Cultural Psychology*, 38, 173–212.

Tett, R P., Jackson, D. N., & Rothstein, M. (1991). Personality measures as predictors of job performance: A meta-analytic review. *Personnel Psychology*, 44, 703–42.

Tett, R. P., Steele, J. R., & Beauregard, R. S. (2003). Broad and narrow measures on both sides of the personality–job performance relationship. *Journal of Organizational Behavior*, 24(3), 335–56.

Appendix: 16PF overview of Primary Factors mapped onto Global Factors

Global Factor	Primary Factors
Extraversion (Relating to Others)	Warmth Liveliness Social Boldness Privateness (−) Self-Reliance (−)
Self-Control (Structure and Flexibility)	Liveliness (−) Rule-Consciousness Abstractedness (−) Perfectionism
Independence (Influence and Collaboration)	Dominance Social Boldness Vigilance Openness to Change
Tough-Mindedness (Thinking Style)	Warmth (−) Sensitivity (−) Abstractedness (−) Openness to Change (−)
Anxiety (Management of Pressure)	Emotional Stability (−) Vigilance Apprehension Tension

(−) indicates a negative relationship between the Global and Primary Factors.