

# Predicting Talent Management Indices Using the 16 Primary Personality Factors

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## Abstract

This study investigates whether or not talent management indices (i.e., leadership potential, leadership style, sales potential, etc.) can be predicted from narrow personality traits. Using a double cross-validation strategy, the data (N=10,261), which are representative of the United States general population, indicate that personality, as measured by the 16 Personality Factors (16PF®) Select, predicts talent management indices.

## Introduction

Talent management is becoming a critical area for an organization's success in the recent weak economy (The Conference Board, 2003). Newhouse, Lewis, and Jones (2004) define talent management as: "ensuring that a sufficient supply of talent is available across the organization to achieve competitive advantage, enhanced corporate performance, and maximizing the productivity of an organization's talent pool. It involves process consulting which includes forecasting openings and needed resources, using assessments for selection and development, placing employees onto appropriate projects, planning for and measuring the return on investment of personnel programs, utilizing technology advancements, and more. Talent management spans the entire talent life cycle from entry to exit, from placement to promotion (p. 5)."

Leading experts on the changing role of HR in the talent economy have recognized that the ability to perform the work needed goes beyond skills and

abilities. Instead, general competencies, such as personality characteristics, enable adaptation to changing environmental demands (Lengnick-Hall & Lengnick-Hall, 2003). Recruitment and selection activities at entry into the organization must be focused on organization fit, value fit, and attitudes, rather than hiring individuals based on specific skills and experiences. This provides a basis for focusing on assessing a candidate's personality, not only on his or her knowledge or skills. In addition, part of the talent management process includes choosing among the best current employees to develop in anticipation of future promotional opportunities. In fact, current employees are the assets organizations have been neglecting (Pigott & Jones, 2004). Organizations can no longer assume employees are happy once they are selected and placed. Personality assessment is one way to determine which employees may be the best ones for developing talent – particularly in the areas of leadership and sales<sup>1</sup>.

Personality assessment can provide information about an individual that can be used for multiple talent management purposes. A personality assessment can be given in a pre-employment screening situation and used as a basis for selection into the organization, along with other assessments and selection methods. The results from this initial assessment can then be used after the individual has been hired in order to identify areas of strength, development needs, and fit to other positions along established career paths. In summary, personality assessment is a powerful tool to include in any talent management system.

The first research question addressed in this study is whether talent management indices (i.e., leadership potential, leadership style, sales potential, creative potential, etc.) can be predicted from narrow personality traits. Specifically, the 16 Personality Factor (16PF) Select (Kelly, 1999) is used to predict nine talent management indices relevant to organizations today. A second research question is to determine the relationship between the 16PF Select and the five Global Factors (i.e., the Big Five) that

<sup>1</sup> Job-related personality assessments are the focus of this study, not clinical/diagnostic personality assessments.

are assessed in the 16PF Fifth Edition Questionnaire (Cattell, R. B., Cattell, A. K., & Cattell, H. E., 1993). Currently, the 16PF Select does not generate the 5 Global Factor scores as the 16PF Fifth Edition does (i.e., Extraversion, Anxiety, Tough-Mindedness, Independence, and Self-Control). The third and final research question is to assess if broad personality traits, as assessed by the 16PF Select Big Five Global Factors, can also predict the same nine talent management indices.

## Method

### Participants

The 16PF Fifth Edition Questionnaire U.S. general population normative database (N=10,261) was used for this study (cf. Maraist & Russell, 2002). Demographic details about the total sample are presented in Table 1. This sample (N=10,261) was randomly split into two sub-samples (Sample A, N=5,090; Sample B, N=5,171). This was done to conduct separate cross-validation studies in order to evaluate the research questions. Demographic details about both samples are presented in Tables 2 and 3, for Samples A and B, respectively.

### Materials

The 16PF Select is a shortened form of the 16PF Fifth Edition Questionnaire developed specifically for use in personnel selection situations (Cattell, et al., 1993; Kelly, 1999). Professionals who use the 16PF Select identify through a thorough personality-based job analysis which job-relevant personality dimensions are important for the ideal candidate to possess. The 16PF Select system generates a report containing the overall similarity of the test taker to the profile of the ideal candidate for the job. The 16PF Select report also contains narrative detail on ways the candidate is similar to and different from the ideal profile.

The 16PF Select Questionnaire obviously differs from the 16PF Fifth Edition Questionnaire. The 16PF Select contains 107 items that encompass 12 primary personality factor scales and three response style

indices. The 12 scales of the 16PF Select are Warmth, Calmness, Dominance, Liveliness, Rule-Consciousness, Social Boldness, Trust, Imagination, Self-Assuredness, Open-Mindedness, Self-Reliance, and Organization (Kelly, 1999). Each scale contains 8 or 9 items. The response style indices include impression management, acquiescence, and infrequency. The 16PF Fifth Edition normative sample used in this study was rescored to include only the 16PF Select items and primary factor scales.

### Procedure

As stated above, the total norm sample (N=10,261) was randomly split into two sub-samples (Sample A, N=5,090; Sample B, N=5,171). Nine talent management indices were evaluated in this study. These included the Leadership Potential Index, three Leadership Style indices (i.e., Assertive Style, Facilitative Style, and Permissive Style), the Sales Potential index, the Creative Potential index, the Dependability index, the Safety index, and the Customer Service index. Each of the indices is a composite of 16PF primary factors. In addition, each index was originally developed using the 16PF Fifth Edition Questionnaire in criterion-related validity studies for a variety of organizations.

A double cross-validation procedure was used to examine all three research questions. In step 1, in both sub-samples using the original 16PF Fifth Edition Questionnaire composite equations, criterion variables were created of the Big Five Global factors and the talent management indices. For example, an Extraversion criterion variable was computed in Sample A and Sample B and the Fifth Edition Leadership Potential composite was also computed.

For step 2, using Sample A first, the criterion variables (i.e., the Big Five Global factors and talent management indices) were individually regressed onto the 12 16PF Select scales (for research questions one and two) and Big Five Global factors (for research question three).<sup>2</sup> If all 12 primary

<sup>2</sup> In predicting the Big Five Global factors, the theoretical model was used to determine which 16PF Select primary factors would be included

scales were not significant predictors of the criterion variable, hierarchical regression was used to determine the set of scales that best predicted that criterion variable. For example, if only 5 of the 16PF Select scales significantly predicted the criterion variable, then those 5 scales would be included in model 1 of the hierarchical regression, followed by the remaining 7 scales. If the change in R-square between the models was non-significant, the scales in model 1 would be the “best fit” composite.

In step 3, the resulting regression equations (composites) from Step 2 were then used to compute the particular index in Sample B. In step 4, the original criterion variable (created from the Fifth Edition composites in step 1) was correlated with the new Sample A composite variable (from Step 3). This correlation is the cross-validated R for Sample A. Steps 2 through 4 were then repeated in Sample B to develop a second composite equation. In step 5, the 16PF Select scales that were found to be significant in both Samples A and B were used to predict the criterion variables in the total norm sample (N=10,261). In all cases, the same scales were found to be significant in both Sample A and Sample B.

## Results

The results for the first research question are presented in Table 4. The results summarized here indicate the cross validation R for each sample (Ra = Sample A; Rb = Sample B), the multiple R for the total sample (Rt), and the R-square for the total sample<sup>3</sup>. These are summarized below:

- The Leadership Potential Index was predicted by eight primary factors (Ra=Rb=Rt=.94; R-square=.88).
- The Assertive Leadership Style was also predicted by eight primary factors (Rb=.92; Ra=Rt=.91; R-square=.83).

in the analysis, e.g., only Dominance, Social Boldness, Trust, and Open-Mindedness were included in the regression analysis for Independence while the other 8 scales were excluded).

<sup>3</sup> All R-square and adjusted R-square values were equal across all research questions and equations.

- The Facilitative Leadership Style was predicted by six primary factors (Rb=.87; Ra=Rt=.86; R-square=.74).
- The Permissive Leadership Style was predicted by nine primary factors (Ra=.96; Rb=Rt=.95; R-square=.91).
- The Sales Potential was also predicted by nine primary factors (Ra=Rb=Rt=.89; R-square=.79).
- The Creative Potential index was predicted by five primary factors (Ra=Rb=Rt=.95; R-square=.90).
- The Dependability index was predicted by two primary factors (Ra=Rb=Rt=.96; R-square=.92).
- The Safety index was predicted by seven primary factors (Ra=.92; Rb=Rt=.93; R-square=.86).
- The Customer Service index was predicted by four primary factors (Ra=Rb=Rt=.98; R-square=.95).

Results for the second research question are presented in Table 5. These results are summarized below:

- Extraversion was predicted by four primary factors (Ra=Rb=Rt=.94; R-square=.89).
- Anxiety was predicted by three primary factors (Ra=Rb=Rt=.87; R-square=.76).
- Tough-Mindedness was predicted by three primary factors (Ra=Rb=Rt=.83; R-square=.69).
- Independence was predicted by four primary factors (Ra=Rb=Rt=.95; R-square=.89).
- Self-Control was also predicted by four primary factors (Ra=Rb=Rt=.97; R-square=.93).

Finally, the results for the final research question are presented in Table 6. These results are summarized below:

- The Leadership Potential index was predicted by all the Big Five Global factors (Ra=Rb=Rt=.92; R-square=.85).

- The Assertive Leadership Style index was also predicted by all the Big Five Global factors ( $R_b=.87$ ;  $R_a=R_t=.86$ ;  $R\text{-square}=.74$ ).
- The Facilitative Leadership Style index was predicted by four Big Five Global factors ( $R_a=.83$ ;  $R_b=R_t=.84$ ;  $R\text{-square}=.70$ ).
- The Permissive Leadership Style index was predicted by all the Big Five Global factors ( $R_b=.91$ ;  $R_a=R_t=.92$ ;  $R\text{-square}=.84$ ).
- The Sales Potential index was predicted by all the Big Five Global factors ( $R_a=.60$ ;  $R_b=R_t=.61$ ;  $R\text{-square}=.37$ ).
- The Creative Potential index was predicted by three Big Five Global factors ( $R_a=R_b=R_t=.86$ ;  $R\text{-square}=.74$ ).
- The Dependability index was predicted by one Big Five Global factor ( $R_a=R_b=R_t=.90$ ;  $R\text{-square}=.82$ ).
- The Safety index was predicted by two Big Five Global factors ( $R_a=R_b=.92$ ;  $R_t=.91$ ;  $R\text{-square}=.84$ ).
- The Customer Service index was predicted by one Big Five Global factor ( $R_a=R_b=R_t=.97$ ;  $R\text{-square}=.94$ ).

Across all three research questions, the cross-validation R for each sample indicated a sufficient overlap for all composite equations with the original equations.

## Discussion

The results indicate that both narrow and broad personality traits such as the primary and Big Five Global factors assessed by the 16PF Select are sound predictors of relevant talent management indices (i.e., leadership potential, leadership style, sales/service potential, etc.). It is important to note that although the Big Five Global factors were significant predictors, the narrow traits assessed by the primary factors were better and stronger predictors in all cases. The narrow personality traits outperformed the broad traits across all nine indices.

The practical implications are that HR professionals can utilize the 16PF Select with broader talent

management issues. The key issue is that a Talent Management Guide can be generated based on a shorter, streamlined personality questionnaire. The 16PF Select can provide useful information that can be used for many talent management purposes, not just employee selection. An example of a Talent Management Guide can be found in Appendix A.

Future research is needed on a key feature of the Talent Management Guide, the Person-Job Fit Matrix. This research should look at the relationship between 16PF Select scores and person-job fit data. The research available today does show that person-job fit is a significant predictor of many criteria of interest, including job performance, turnover, supervisor ratings of organizational citizenship behaviors, and objective measures of performance (Hoffman & Woehr, 2004; Lundquist, Kudisch, Fleming, & Fortunato, 2004). Additionally, research has shown that including a person-job fit instrument in a selection battery will add significant incremental variance in the prediction of job performance above traditional selection methods (Lawrence, Doverspike, & O'Connell, 2004).

Some may view that a limitation of this study is that the sample was not specific to any organizational setting. Because the data came from a normative database, respondents completed the assessment for a variety of purposes in numerous settings including counseling, career placement, educational, and employment purposes. Some would say a sample of respondents who are job incumbents could have been an alternate choice. In actuality, however, the results based on this sample are more generalizable than the alternative because they are representative of the general United States population as a whole.

In conclusion, the 16PF Select scales predicted relevant talent management indices. Thus, a personality assessment can assist organizations in selecting whom to develop for a variety of positions, including those in leadership and sales. By predicting which employees will be most successful in future positions, organizations can save time, effort, and money by managing the talent of their current employees.

Table 1: Demographics for 16PF Fifth Edition General Population Norms (N=10,261).

Gender	Number in Sample	% in Sample
Male	5,124	49.9%
Female	5,137	50.1%
Race	Number in Sample	% in Sample
White	7,994	77.9%
Black/African American	1,113	10.8%
American Indian	79	0.8%
Asian American	368	3.6%
Multiracial	149	1.5%
Other	558	5.4%
Hispanic Origin	887	8.6%

**Note:** Totals add up to over 100% because Hispanics also endorsed one of the six race categories.

### Age Group

Respondents' Age (years)	Number in Sample	% in Sample
15 to 24	3,714	36.2%
25 to 44	4,282	41.7%
45 to 54	1,614	15.7%
55 to 64	577	5.6%
65 and over	74	0.7%

### Education Level

Respondents' Education	Number in Sample	% in Sample
H.S. Graduate, or less	2,541	24.7%
Some College	2,901	28.3%
College Graduate	4,819	47.0%

Table 2: Demographics for Sample A (N=5,090).

Gender	Number in Sample	% in Sample
Male	2,559	50.3%
Female	2,531	49.7%
Race	Number in Sample	% in Sample
White	3,964	77.9%
Black/African American	543	10.7%
American Indian	49	1.0%
Asian American	184	3.6%
Multiracial	77	1.5%
Other	273	5.4%
Hispanic Origin	433	8.5%

**Note:** Totals add up to over 100% because Hispanics also endorsed one of the six race categories.

### Age Group

Respondents' Age (years)	Number in Sample	% in Sample
15 to 24	1,835	36.1%
25 to 44	2,127	41.8%
45 to 54	805	15.8%
55 to 64	288	5.7%
65 and over	35	0.7%

### Education Level

Respondents' Education	Number in Sample	% in Sample
H.S. Graduate, or less	1,251	24.6%
Some College	1,474	29.0%
College Graduate	2,365	46.5%

Table 3: Demographics for Sample B (N=5,171).

Gender	Number in Sample	% in Sample
Male	2,565	49.6%
Female	2,606	50.4%
Race	Number in Sample	% in Sample
White	4,030	77.9%
Black/African American	570	11.0%
American Indian	30	0.6%
Asian American	184	3.6%
Multiracial	72	1.4%
Other	285	5.5%
Hispanic Origin	454	8.8%

**Note:** Totals add up to over 100% because Hispanics also endorsed one of the six race categories.

### Age Group

Respondents' Age (years)	Number in Sample	% in Sample
15 to 24	1,879	36.3%
25 to 44	2,155	41.7%
45 to 54	809	15.6%
55 to 64	289	5.6%
65 and over	39	0.8%

### Education Level

Respondents' Education	Number in Sample	% in Sample
H.S. Graduate, or less	1,290	25.0%
Some College	1,427	27.6%
College Graduate	2,454	47.5%

Table 4: Double Cross-Validation Results for Talent Management Indices Predicted from 16PF Select Primary Factors.

**Total Sample**

Talent Management Index	Multiple R	R-square	Adjusted R-square	Cross-validated R (from double-cross validation Sample A)	Cross-validated R (from double-cross validation Sample B)
Leadership Potential	.94	.88	.88	.94	.94
Assertive Style	.91	.83	.83	.91	.92
Facilitative Style	.86	.74	.74	.86	.87
Permissive Style	.95	.91	.91	.96	.95
Sales Potential	.89	.79	.79	.89	.89
Creative Potential	.95	.90	.90	.95	.95
Dependability	.96	.92	.92	.96	.96
Safety	.93	.86	.86	.92	.93
Customer Service	.98	.95	.95	.98	.98

Table 5: Double Cross-Validation Results for Big Five Global Factors Predicted from 16PF Select Primary Factors.

**Total Sample**

Big Five Global Factor	Multiple R	R-square	Adjusted R-square	Cross-validated R (from double-cross validation Sample A)	Cross-validated R (from double-cross validation Sample B)
Extraversion	.94	.89	.89	.94	.94
Anxiety	.87	.76	.76	.87	.87
Tough-Mindedness	.83	.69	.69	.83	.83
Independence	.95	.89	.89	.95	.95
Self-Control	.97	.93	.93	.97	.97

Table 6: Double Cross-Validation Results for Talent Management Indices Predicted from 16PF Select Big Five Global Factors.

**Total Sample**

Talent Management Index	Multiple R	R-square	Adjusted R-square	Cross-validated R (from double-cross validation Sample A)	Cross-validated R (from double-cross validation Sample B)
Leadership Potential	.92	.85	.85	.92	.92
Assertive Style	.86	.74	.74	.86	.87
Facilitative Style	.84	.70	.70	.83	.84
Permissive Style	.92	.84	.84	.92	.91
Sales Potential	.61	.37	.37	.60	.61
Creative Potential	.86	.74	.74	.86	.86
Dependability	.90	.82	.82	.90	.90
Safety	.91	.84	.84	.92	.92
Customer Service	.97	.94	.94	.97	.97

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