

BIG-FIVE ADJECTIVE MARKER SCALES FOR USE WITH COLLEGE STUDENTS¹

RALPH L. PIEDMONT

Loyola College in Maryland

Summary.—This report evaluated the psychometric integrity of an 80-item bipolar adjective scale which assesses the dimensions of the five-factor model of personality. Using a college sample of 149 women and 30 men, a principal components analysis employing an orthogonal Procrustes rotation identified the five factors which were comparable to factor structures found with adults. Researchers can therefore have some confidence in using these marker scales with college students.

The five-factor model has emerged as an attractive taxonomy of personality traits (McCrae & John, 1992). The dimensions of Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness have been shown to be remarkably robust, not only in terms of structure and stability (Costa & McCrae, 1994), but also in terms of description and prediction of salient life outcomes (e.g., Piedmont & Weinstein, 1994). Although there are commercially available instruments designed to capture these five dimensions, the expense, time involvement to complete, and scoring complexity make them logistically impractical for use in small preliminary studies designed to address modest empirical questions. As such, simpler, more economical measures of the five factors have been developed (e.g., Goldberg, 1992; Saucier, 1994). These adjective-based instruments serve as broad markers of the five factors and can be used as general stand-ins for their more sophisticated relatives.

Although these different adjective marker scales essentially capture the same constructs (Costa & McCrae, 1992), the one developed by McCrae and Costa (1985) offers two advantages. First, it was built on the work of Cattell (1945) and Norman (1963) who were early pioneers on the five-factor model and provides a useful theoretical pedigree. Second, McCrae and Costa have provided strong evidence of convergent and discriminant validity for these scales over raters and instruments (McCrae & Costa, 1985, 1987). However, McCrae and Costa worked exclusively with adults, and no psychometric evidence has been provided for college students. The purpose of this report is to fill this gap. The factor structure of the scale in a college sample was

¹The author thanks Susan Blanco, David Hill, Christine Stillwell, Pamela Cook, Lee Link, Daniel Panaseth, Aysha Saqib, Angie Weaver, and Matthew White for sharing parts of their data with me. Address enquiries to R. L. Piedmont, Department of Pastoral Counseling, Loyola College in Maryland, 7135 Minstrel Way, Columbia, MD 21045.

compared with previous data from adults to evaluate comparability and help establish the scale as valid for this population.

METHOD

Subjects were 149 women and 30 men, mostly Caucasian, between the ages of 17 and 24 years. All subjects volunteered. Data were aggregated from several studies. Subjects completed the 80-item bipolar adjective scale developed by McCrae and Costa (1985). Each adjective pair is rated on a 7-point scale. Half the items are reverse scored to control for acquiescence. Scores for each dimension are found by summing responses on the relevant items.

RESULTS AND DISCUSSION

Descriptive statistics and alpha reliabilities are presented in Table 1. Women scored significantly higher on Extraversion ($t_{177} = 2.03$, $p < .05$) and Agreeableness ($t_{177} = 2.34$, $p < .05$), suggesting a more outgoing and trusting interpersonal style. Alphas are all quite high. The average interscale correlation was .10, suggesting that these dimensions are relatively orthogonal. However, there were some notable exceptions: Extraversion and Agreeableness ($r_{177} = .51$, $p < .001$) and Neuroticism and Conscientiousness ($r_{177} = -.36$, $p < .001$). Such associations are not surprising, having been found with other measures of the five-factor model, and are in fact theoretically relevant (see Piedmont, 1994). This increases confidence that these scales capture the dimensions of the five-factor model in ways similar to other such measures.

TABLE 1
DESCRIPTIVE STATISTICS AND ALPHA RELIABILITIES FOR THE
BIPOLAR ADJECTIVE SCALES SEPARATELY BY GENDER

Scale	Women, $n = 149$		Men, $n = 30$		Alpha $N = 179$
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Neuroticism (N)	50.53	11.0	47.30	10.4	.80
Extraversion (E)	71.92	11.6	67.33	9.6	.83
Openness (O)	60.77	9.4	60.00	7.6	.71
Agreeableness (A)	92.29	12.1	86.63	11.8	.83
Conscientiousness (C)	118.50	11.8	114.03	12.8	.81

Scores were subjected to a principal components analysis with five factors extracted and orthogonally rotated. Using the factor structure found with raters by McCrae and Costa (1987) as the target matrix, the factor loadings were subjected to an orthogonal Procrustes rotation (Schönemann, 1966). Congruence coefficients were calculated between the new Procrustes loadings and the loadings in the target matrix. Coefficients of .89, .92, .88, .90, and .85 were found for Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness, respectively. Using the critical values provided by McCrae, Costa, Bond, and Paunonen (in press) as reference points,

these obtained values are all significant, demonstrating that the factor structure of the present data set is equivalent to that found with adult data. Overall, the results of this study support the use of these adjective scales with college students.

REFERENCES

- CATTELL, R. B. (1945) The principal trait clusters for describing personality. *Psychological Bulletin*, 42, 129-161.
- COSTA, P. T., JR., & McCRAE, R. R. (1992) Comparability of alternate measures of the five-factor model in peer ratings. Paper presented at the Annual Convention of the American Psychological Society, San Diego.
- COSTA, P. T., JR., & McCRAE, R. R. (1994) Set like plaster? Evidence for the stability of adult personality. In T. F. Heatherton & J. L. Weinberger (Eds.), *Can personality change?* Washington, DC: American Psychological Association. Pp. 21-40.
- GOLDBERG, L. R. (1992) The development of markers for the Big-Five factor structure. *Psychological Assessment*, 4, 26-42.
- 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.
- 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, 81-90.
- McCRAE, R. R., COSTA, P. T., JR., BOND, M. H., & PAUNONEN, S. V. (in press) Evaluating replicability of factors in the Revised NEO Personality Inventory: confirmatory factor analysis and Procrustes rotation. *Journal of Personality and Social Psychology*.
- McCRAE, R. R., & JOHN, O. P. (1992) An introduction to the five-factor model and its applications. *Journal of Personality*, 60, 175-215.
- 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, 574-583.
- PIEDMONT, R. L. (1994) Validation of the NEO PI-R observer form for college students: toward a paradigm for studying personality development. *Assessment*, 1, 259-268.
- PIEDMONT, R. L., & WEINSTEIN, H. P. (1994) Predicting supervisor ratings of job performance using the NEO Personality Inventory. *The Journal of Psychology*, 128, 255-265.
- SAUCIER, G. (1994) Mini-markers: a brief version of Goldberg's unipolar Big Five markers. *Journal of Personality Assessment*, 63, 506-516.
- SCHÖNEMANN, P. H. (1966) A generalized solution of the orthogonal Procrustes problem. *Psychometrika*, 31, 1-10.

Accepted May 24, 1995.