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## Further Investigation of the Psychometric Properties of Saucier's Big Five "Mini-Markers:" Evidence for Criterion and Construct Validity

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**ABSTRACT** - The present study further investigated the criterion and construct validity of Saucier's (1994) big five adjective "mini-markers." The mini-markers demonstrated criterion validity very comparable to Goldberg's (1999) big five questionnaire. A multitrait-multimethod matrix examination (questionnaire vs. adjective checklist) did not rule out the convergent and discriminant validity of the mini-markers. Overall, the results indicate the mini-markers to hold promise as a viable measure of the big five, given the support of future research.

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During the past two decades a wealth of evidence has accumulated in support of a five-factor structure of personality. This "big five" model of personality postulates that personality traits fall into five broad categories: extraversion, agreeableness, conscientiousness, neuroticism (or emotional stability), and openness to experience (or intellect). Two separate research approaches have converged onto this conclusion. The first is that of Costa and McCrae (1992; McCrae & Costa, 1997), who argue that the big five represents basic (genotypic) human categories of behavior, common across all cultures. The second is that of Goldberg and associates (Goldberg, 1993; 1990; Saucier & Goldberg, 2001). Their lexical, phenotypic approach does not make assumptions about the causes of personality structure, but rather involves investigation into how language is used to describe personality. The approaches don't perfectly overlap. For example, "neuroticism" in Costa and McCrae's model is "emotional stability" in Goldberg's. Nonetheless, the two approaches have many commonalities and the accumulated research for both approaches presents a strong case for the notion that personality can be accurately and parsimoniously described as comprising of five factors.

The big five theory has generated a vast amount of research, especially investigations into the ability of the five traits to predict behavioral criteria. These criteria range from work performance (Barrick & Mount, 1991), performance in college (Wolfe & Johnson, 1995), performance of work teams (Neuman, Wagner, & Christiansen, 1999) coping with

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stress (Vollrath & Torgersen, 2000), to young adult drinking (Stewart & Devine, 2000), among many others. In particular, conscientiousness has proven a reliable and valid predictor of several different criteria (Barrick & Mount, 1991; Busato, Prins, Elshout, & Hamaker, 2000). Thus, the research indicates some of the big five traits have usefulness in applied settings, such as employee or student selection, counseling, and employee development.

For example, several studies have indicated affect to be related to some big five subscales. In a study of married and dating couples, Watson, Hubbard, and Wiese (2000) found neuroticism to be negatively related to relationship satisfaction, while extraversion, agreeableness, and conscientiousness were positively related to satisfaction. Judge, Higgins, Thoresen, and Barrick (1999) found neuroticism and agreeableness to be negatively related to intrinsic (career) satisfaction, while conscientiousness was positively related.

Given the support for the usefulness of the big five model, the question of which big five tests are reliable and valid is raised. A variety of instruments designed to measure the big five traits have been developed. The most popular versions of the big five are probably the NEO-PI-R (Costa & McCrae, 1992) and NEO-FFI (Costa & McCrae, 1992). Public domain versions of the big five, such as Lewis Goldberg's (1999) questionnaire, have recently been developed. The research on this public domain version has been very supportive of its reliability and validity (Goldberg, 1999; Ployhart, Lim, & Chan, 2001). Furthermore, Goldberg has developed both a questionnaire (Goldberg, 1999) and a set of adjective markers (Goldberg, 1992) for measuring these traits, with both methods receiving support as viable big five measures.

There were shortcomings with Goldberg's adjective markers, however, including high interscale correlations and the fact that some of the adjectives are seldom used in everyday discourse (e.g., "imperturbable," Saucier, 1994). Due to these shortcomings Saucier (1994) developed from Goldberg's adjective markers a set of big five "mini-markers," consisting of 40 adjectives, with eight adjectives measuring each of the big five traits. The resulting mini-marker subset items consisted of fewer "negation terms," i.e., adjectives beginning with "in" or "un" (e.g., uncreative), and overall has good psychometric properties (Saucier, 1994).

If proven reliable and valid, the "mini-markers" would greatly simplify measurement of the big five. They are easily understood, and easily and very quickly administered and scored. Despite this potential, only a couple of studies have examined their psychometric properties. Dwight, Cummings, and Glenar (1998) found the mini-markers to have criterion validity in predicting exam scores, self-reported college grade point average, high school grade point average, and SAT scores comparable to that of Goldberg's adjective markers. This would be expected since Saucier's markers are a smaller subset of Goldberg's. However, no study has assessed the comparative criterion validity of Saucier's markers with respect to that of a big five questionnaire measure. Mooradian and Nezelek (1996) compared the factor structure of the NEO-FFI and the adjective mini-markers. They found the measures to have similar psychometric properties, though neither measure produced a strong factor structure. This latter finding, however, was not surprising, as confirmatory models of personality have proven difficult to fit to data (Church & Burke, 1994).

Thus, there is need to further understand the construct and criterion validity of Saucier's adjective mini-markers. The present study will add to the understanding of the mini-markers in two ways. First, we will compare the relationships between both the mini-markers and Goldberg's (1999) questionnaire with four distinct criteria. Second, we will compare the two measures by utilizing a multitrait-multimethod matrix to investigate the

convergent and discriminant validity of their subscales.

## Method

One hundred twenty-nine undergraduates enrolled in a large university served as participants and received course credit for doing so. Ninety-six (74%) were female, and the average age was 19.96 ( $SD=3.27$ ).

### *Big Five*

Measures of big five personality traits included Goldberg's big five questionnaire (Goldberg, 1999) and Saucier's adjective mini-markers (Saucier, 1994). The former measures extraversion, agreeableness, conscientiousness, emotional stability, and intellect via 50 self-referent statements and a 1 to 5 ("Strongly Agree" to "Strongly Disagree") Likert scale. The latter measures the same constructs via 40 adjectives and a 1 to 9 ("Extremely Accurate" to "Extremely Inaccurate") scale that ask the respondent to estimate, "how accurately that trait describes you."

### *Criteria*

Four conceptually distinct criteria were used; these included life satisfaction, emotional intelligence, age, and gender. Satisfaction was measured via Pavot, Diener, Colvin, & Sandvik's (1991) "Satisfaction with Life Scale." This scale includes five self-referent statements rated via a seven-point ("Strongly Agree" to "Strongly Disagree") Likert scale, and has been demonstrated to have good reliability and predictive validity (Pavot, et al., 1991).

Emotional intelligence, described as consisting of the ability to adapt, regulate, and express one's emotions when solving problems (Salovey & Mayer, 1990), was assessed via the 33-item, single factor, five-point ("Strongly Agree" to "Strongly Disagree") emotional intelligence measure developed by Schutte, Malouff, Hall, Haggerty, Cooper, Golden, and Dornheim (1998). This construct was chosen because it has recently been linked to the extraversion and emotional stability subscales of the big five (van der Zee, Thijs, & Schakel, 2002).

Finally, age and gender were included as criteria because age has been positively linked to conscientiousness (Goldberg, Sweeney, Merenda, & Hughes, 1998) and gender has been linked to four of the five criteria (Dwight, Cummings, and Glenar, 1998) for both the mini-markers and Goldberg's larger set of markers.

### *Construct Validity*

While confirmatory factor analysis (CFA) is the typical method used with multitrait-multimethod designs, their use at assessing the factor structure of personality models has been questioned more than once (Mooradian & Nezlek, 1996; Church & Burke, 1994). Thus, the present study utilized Campbell and Fiske's (1959) criteria. The criterion for convergent validity is that "The entries in the validity diagonals should be significantly different from zero and sufficiently large to encourage further examination of validity" (p. 82). The three criteria for discriminant validity are that 1) "a validity value for a variable should be higher than the correlations obtained between that variable and any other variable having neither trait nor method in common" (p. 82), 2) a variable should have a higher correlation with the same trait measured via a different method than with other traits measured with the same method, and 3) the pattern of correlations for different traits measured via the same and different methods should be similar.

## Results

Descriptives for the big five measures and the multitrait-multimethod matrix, consisting of 45 correlations and ten reliabilities, are presented in Table 1 (See Table 1). Reliabilities (Coefficient Alpha, bold face font in Table 1) replaced 1.00's in the main diagonal and these are very similar to those reported by Goldberg (Goldberg, 1999) and Saucier (1994).

**Table 1**  
**Multitrait - Multimethod Matrix**

	Goldberg					Mini-Markers				
	E	A	C	ES	I	E	A	C	ES	I
<b>Goldberg</b>	<b>.920</b>									
A	.258*	<b>.771</b>								
C	.146	.252*	<b>.771</b>							
ES	.282*	.170	.105	<b>.866</b>						
I	.320**	.201	.092	.190	<b>.805</b>					
<b>Mini-Markers</b>						<b>.865</b>				
E	<b>.852**</b>	.202	.143	.338**	.246*	.032	<b>.859</b>			
A	.020	<b>.653**</b>	.249*	.190	-.002	.055	.154	<b>.766</b>		
C	.021	.077	<b>.747**</b>	.065	-.132	-.006	<b>.334**</b>	.144	<b>.744</b>	
ES	.001	.161	.249*	<b>.561**</b>	.087	<b>.313**</b>	.090	-.082	.072	<b>.770</b>
I	.236*	.269*	.041	.238*	<b>.735**</b>					
Mean Inter-item r	.541	.262	.249	.393	.297	.438	.446	.271	.269	.305
$\bar{X}$	3.48	4.16	3.58	3.06	3.68	6.25	7.53	6.52	5.57	6.71
SD	0.87	0.49	0.58	0.74	0.57	1.42	1.01	1.09	1.19	1.05
N	129	129	129	129	129	129	129	129	129	129

### Criterion Validity

Differential criterion validity was assessed by comparing the correlations between the two sets of big five traits and 1) life satisfaction, 2) emotional intelligence, 3) age, and 4) gender. Reliabilities (Coefficient Alpha) were .86 for life satisfaction and .86 for emotional intelligence. Correlations between the big five measures and the criteria are presented in Table 2 (See Table 2). Because all measures came from the same sample, we used Steiger's (1980) z-test for comparing dependent correlation coefficients having one measure in common (See Appendix A).

As recommended by Steiger (1980), sample estimates were used where population parameters are indicated. Only three of the z-values reached significance. Two of these were for emotional stability, with Goldberg's measure having larger correlations with gender ( $z = 2.19, p < .05$ ) and with life satisfaction ( $z = -2.03, p < .05$ ). The Goldberg measure of agreeableness correlated more strongly with emotional intelligence ( $z = -2.61, p < .05$ ). Overall, however, the agreement between the two big five measures and the criteria is very impressive. Furthermore, with 20 total correlations compared, a very plausible explanation for the three differences is chance. This is highlighted by the fact that both emotional stability-gender correlations have negative signs, even if one is very small, and the fact that emotional stability-life satisfaction and the agreeableness-emotional intelligence correlations were all large and significant, regardless of which big five measure was used. Thus, the differences between the correlations are

mostly of magnitude rather than differences in significance. Overall, the results provide strong evidence for the criterion validity of the mini-markers, relative to that of Goldberg's (1999) measure.

**Table 2**  
***Differential Criteria Validities for the Two Big Five Measures***

	Gender	Age	Life Satisfaction	Emotional Intelligence
Extraversion	.145 / .117	.039 / .132	.279** / .211*	.410** / .436**
z	-.058	1.93	-1.45	0.60
Agreeableness	.342** / .387**	-.078 / -.085	.136 / .137	.410** / .229**
z	0.66	-0.09	0.01	-2.61*
Conscientiousness	.120 / .046	.123 / .205*	.298** / .243**	.298** / .195*
z	-1.17	1.31	-0.91	-1.69
Emotional Stability	-.184* / -.003	.283** / .316**	.415** / .258**	.269** / .236**
z	2.19*	0.42	-2.03*	-0.41
Intellect	-.084 / -.027	.075 / .161	.048 / .020	.358** / .336**
z	0.88	1.34	-0.43	-0.37

Note: The first correlation presented is for the Goldberg questionnaire and the second is for Saucier's mini-markers.

$N=129$  \* $p<.05$  \*\* $p<.01$  (2-tailed)

### ***Construct Validity***

Support for convergent validity would be indicated if the five (of 45) highest correlations are those from the validity diagonal; this was found. These ranged from .561 ( $p<.001$ ) to .852 ( $p<.001$ ). This finding also meets Campbell and Fiske's (1959) first two criteria for discriminant validity. Examination of the pattern of correlations between traits measured via the same and different methods does not provide strong support for the third condition. While the correlation between extraversion and intellect was significant for both questionnaire-adjective and adjective-questionnaire, four other correlations were significant without their counterparts reaching significance. For example, the correlation between Goldberg's emotional stability and Saucier's extraversion was .338 ( $p<.01$ ), but the correlation between Saucier's emotional stability and Goldberg's extraversion was .001 (n.s.). Furthermore, while four of the correlations between different questionnaire subscales are significant, only two of the correlations between different adjective subscales are. This does, however, correspond to Saucier's (1994) finding of low interscale correlations for the mini-markers. Overall, the results provide modest evidence for the construct validity of the mini-markers, relative to that of Goldberg's (1999) measure.

### **Discussion**

The objective of the present study was to further investigate the psychometric properties of Saucier's (1994) big five adjective mini-markers. Specifically, we 1)

compared the criterion validity of the mini-markers and Goldberg's (1999) measure for four criteria, and 2) examined the convergent and discriminant validity of Saucier's (1994) mini-markers relative to that of Goldberg's (1999) measure.

The comparative criterion validity evidence is strongly in favor of the mini-markers as a viable measure of the big five, relative to Goldberg's questionnaire. Overall, the pattern of subscale-criteria correlations is very similar across the two big five measures. For the 20 total pairs of subscale-criterion correlations compared, in only two cases did a subscale-criterion correlation reach significance when the counterpart subscale-criterion correlation failed to do so, and only one of these subscale-criterion correlation differences was significant (gender-emotional stability). Furthermore, only three of the 20 pairs of correlations (15%) between subscales and criteria were significantly different from one another. In each of these three cases the Goldberg measure was more strongly correlated with the criteria.

Three things should be noted about this, however. First, there were 20 total correlations compared, and the three significant differences are very possibly due to chance. Second, the directions of the correlations were the same across all 20 comparisons and two of the three significant differences were between pairs of very positive and significant  $r$ 's. Third, for two of the three different pairs of correlations, the criteria were measured via questionnaire, as opposed to the mini-marker checklist, and common method variance is possibly the reason for the higher values found between the criteria and Goldberg's questionnaire scale. Overall, the results indicate the two measures to have very comparable criterion validity with respect to the included criteria.

The results provide modest evidence for the convergent and divergent validity of the mini-markers relative to Goldberg's measure. We temper this conclusion because 1) our sample size precluded use of confirmatory factor analysis to examine the hypothesis and 2) Campbell and Fiske's (1959) criteria for discriminant validity were not fully met.

Two important issues deserve notice here. First, the use of confirmatory factor analysis to examine personality structure has shortcomings (Mooradian & Nezlek, 1996; Church & Burke, 1994). Thus, one can't be sure that a larger sample size and a CFA would, for the present hypotheses, add much beyond our findings. Second, Campbell and Fiske's (1959) criteria have their own serious shortcomings (Reichardt and Coleman, 1995). While meeting Campbell and Fiske's criteria do not guarantee convergent or divergent validity, failure to meet the criterion for convergent validity does rule this type of validity out. Overall, however, the pattern of correlations is consistent with convergent validity and partially consistent with discriminant validity. The correlations between the same traits assessed via different methods are profoundly stronger than any of the other correlations in the matrix. We can thus conclude that the results do not rule out convergent and discriminant validity of the mini-marker subscales.

Saucier's adjective mini-markers hold promise as a method for efficiently assessing the big five personality traits; future research should further examine the scale's psychometric properties. The advantages of such an adjective checklist, including ease of use, ease of scoring, length, understandability, simplicity, and the lower interscale correlations, in addition to the fact that it is a public domain test, potentially make it a very valuable tool in the assessment of personality.

## References

- Barrick, M.R., & Mount, M.K. (1991). The Big five personality dimensions and job performance: A Meta-analysis. *Personnel Psychology, 44*, 1-26.
- Busato, V.V., Prins, F.J., Elshout, J.J., & Hamaker, C. (1999). The Relation between learning styles, the Big Five personality traits, and achievement motivation in higher

- education. *Personality and Individual Differences*, 26, 129-140.
- ampbell, D.T., & Fiske, D.W. (1959). Convergent and discriminant validity by the multitrait-multimethod matrix. *Psychological Bulletin*, 56, 81-105.
- hurch, A. T. & Burke, P.J. (1994). Exploratory and confirmatory tests of the big five and Tellegen's three- and four-dimensional models. *Journal of Personality and Social Psychology*, 66, 93-114.
- osta, P.T., & McCrae, R.R. (1992). *Revised NEO Personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FF-I) professional manual*. Odessa, FL: Psychological Assessment Resources.
- wight, S.A., Cummings, K.M., & Glenar, J.L. (1998). Comparison of criterion-related validity coefficients for the mini-markers and Goldberg's markers of the big five personality factors. *Journal of Personality Assessment*, 70(3), 541-550.
- oldberg, L.R. (1990). An Alternative "description of personality": The Big-five factor structure. *Journal of Personality and Social Psychology*, 59(6), 1216-1229.
- oldberg, L.R. (1992). The Development of markers for the Big-Five factor structure. *Psychological Assessment*, 4(1), 26-42.
- oldberg, L.R. (1993). The Structure of phenotypic personality traits. *American Psychologist*, 48(1), 26-34.
- oldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality Psychology in Europe*, Vol. 7 (pp. 7-28). Tilburg, The Netherlands: Tilburg University Press.
- oldberg, L.R., Sweeney, D., Murenda, P.F., & Hughes, J.E. Jr. (1998). Demographic variables and personality: The effects of gender, age, education, and ethnic/racial status on self-descriptions of personality attributes. *Personality and Individual Differences*, 24(3), 393-403.
- idge, T.A., Higgins, C.A., Thoresen, C.J., & Barrick, M.R. (1999). The Big five personality traits, general mental ability, and career success across the life span. *Personnel Psychology*, 52, 621-652.
- fcrae, R.R., & Costa, P.T. (1997). Personality trait structure as a human universal. *American Psychologist*, 52(5), 509-516.
- ooradian, T.A. & Nezlek, J.B. (1996). Comparing the NEO-FFI and Saucier's mini-markers as measures of the big five. *Personality and Individual Differences*, 21(2), 213-215.
- leman, G.A., Wagner, S.H., & Christiansen, N.D. (1999). The Relationship between work-team personality composition and the job performance of teams. *Group and Organization Management*, 24(1), 28-45.
- avot, W., Diener, E., Colvin, C.R., & Sandvik, E. (1991). Further validation of the satisfaction with life scale: Evidence for the cross-method convergence of well-being measures. *Journal of Personality Assessment*, 57(1), 149-161.
- oyhart, R.E., Lim, B., & Chan, K. (2001). Exploring relations between typical and maximum personality ratings and the five factor model of personality. *Personnel Psychology*, 54, 809-843.
- eichardt, C. S., & Coleman, S.C. (1995). The Criteria for convergent and discriminant validity in a multitrait-multimethod matrix. *Multivariate Behavioral Research*, 30(4), 513-538.
- alovey, P., & Mayer, J.D. (1990). Emotional Intelligence. *Imagination, Cognition, and Personality*, 9, 185-211.
- aucier, G. (1994). Mini-markers: A brief version of Goldberg's unipolar big-five markers. *Journal of Personality Assessment*, 63(3), 506-516.
- aucier, G., & Goldberg, L.R. (2001). Lexical studies of indigenous personality factors: Premises, products, and prospects. *Journal of Personality*, 69(6), 847-879.
- chutte, N.S., Malouff, J.M., Hall, L.E., Haggerty, D.J., Cooper, J.T., Golden, C.J., & ornheim, L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, 25, 167-177.
- teiger, J.H. (1980). Tests for comparing elements of a correlation matrix. *Psychological*

*Bulletin*, 87(2), 245-251.

Stewart, S.H., & Devine, H. (2000). Relations between personality and drinking motives in young adults. *Personality and Individual Differences*, 29, 495-511.

Vollrath, M., & Torgersen, S. (2000). Personality types and coping. *Personality and Individual Differences*, 29, 367-378.

Watson, D., Hubbard, B., & Wiese, D. (2000). General traits of personality and affectivity as predictors of satisfaction in intimate relationships: Evidence from self- and partner-ratings. *Journal of Personality*, 68(3), 413-449.

Wolfe, R. N., & Johnson, S. D. (1995). Personality as a Predictor of College Performance. *Educational & Psychological Measurement*, 55(2), 177-185.

van der Zee, K., Thijs, M., & Schakel, L. (2002). The Relationship of emotional intelligence with academic intelligence and the big five. *European Journal of Personality*, 16(2), 103-125.

## Appendix A

### Computation of Steiger's (1980) z-test

$$Z = (N-3)^{1/2} (z_{jk} - z_{jh}) (2 - 2\overline{s_{jk,jh}})^{-1/2}$$

with  $z_{jk}$  and  $z_{jh}$  computed using Fisher's z-transformation,

$$z_{jk} = \frac{1}{2} \ln \left| \frac{1+r_{jk}}{1-r_{jk}} \right|$$

and where

$$\overline{s_{jk,jh}} = \Psi_{jk,jh} / (1 - \rho_{jk}^2)(1 - \rho_{jh}^2),$$

and

$$\Psi_{jk,jh} = \rho_{kh} (1 - \rho_{jk}^2 - \rho_{jh}^2) - \frac{1}{2} (\rho_{jk} \rho_{jh}) (1 - \rho_{jk}^2 - \rho_{jh}^2 - \rho_{kh}^2)$$