

Adjective Check List Scales and the Five-Factor Model

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Correlations of Adjective Check List (ACL; Gough & Heilbrun, 1965, 1983) scales with measures of the five-factor model of personality provide a basis for reinterpreting earlier studies and constructing new ACL scales in terms of a common conceptual framework. In Study 1, 414 undergraduate students (264 women, 150 men) completed the ACL, and scales were factored together with John's (1990) ACL markers of the five factors. In Study 2, 445 (198 women, 247 men) adult volunteers from the Augmented Baltimore Longitudinal Study of Aging completed the ACL. Self-report, spouse, and peer ratings on the NEO Personality Inventory, which measures the five factors, were available for subsets of these Ss. When appropriate markers are used, the five factors can be recovered from the ACL, although most ACL scales are themselves multifactorial.

Correlational studies in which personality measures are related to theoretically relevant criteria are central to the enterprise of personality assessment and theory construction: They provide the basic data by which personality scales are evaluated and personality constructs interpreted. When the instrument examined is of limited interest or when the criteria are carelessly chosen, the study may merit the low esteem frequently accorded to correlational studies. But when the instrument is widely used and the criteria are theoretically illuminating, the results may be of considerable importance to the field.

The present article examines Gough and Heilbrun's (1983) Adjective Check List (ACL) from the perspective of the five-factor model of personality. The original edition of the ACL was one of the most widely used of personality inventories (Buros, 1978), and the appearance of a new edition in 1983 extended its influence. The five-factor model provides a widely recognized taxonomy of personality dimensions—Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness (A), and Conscientiousness (C)—that appear to underlie most personality constructs (Digman, 1990; John, 1990; Wiggins & Trapnell, in press).¹ Correlations of ACL scales with measures of the five factors can provide a basis for reinterpreting in a broader conceptual framework the hundreds of earlier studies that used the ACL; they can also set in context the new scales introduced in the 1983 edition on which much less research has been conducted.

The results of this study should thus be of pragmatic interest to meta-analysts and others reviewing the psychological literature who must be able to group together scales from different instruments that measure the same construct and to distinguish measures that share the same label but measure different constructs. Similarly, interpretations of ACL scales should be useful to clinicians and others who use the ACL for individual

assessment. Yet two theoretical issues also can be addressed by the present research: Can Murray's (1938) needs be validly assessed at all, and is the five-factor model truly comprehensive? Studies using the ACL have raised both these questions.

Validity of Need Scales

In 1973, Fiske reported an analysis of several alternative measures of Murray's needs, including Jackson's (1967) Personality Research Form (PRF) and Edwards's (1959) Personal Preference Schedule (EPPS) as well as the ACL. He examined the intercorrelations of 12 need scales within each of these instruments and noted that the patterns of correlations were not identical. For example, the correlation between ACL Endurance and ACL Achievement was .68, whereas the correlation between EPPS Endurance and EPPS Achievement was .07. Although intended to operationalize the same constructs, the two sets of scales appeared to show dramatically different correlates. Such findings led Fiske to question the possibility of developing empirically validated measures of any personality construct.

Huba and Hamilton (1976) responded to Fiske's (1973) critique with quantitative analyses of his data. While acknowledging anomalies, they demonstrated that the overall pattern of correlations among need scales was remarkably similar for all the different inventories—a necessary though not sufficient condition for valid assessment.

Questions of validity have also arisen when correlations of corresponding need scales have been examined across instruments (e.g., Bessmer & Ramanaiah, 1981). In particular, correlations between EPPS and ACL need scales have often been unacceptably low. Wohl and Palmer (1970) concluded that

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¹ These factors are often designated by the names and factor numerals used by Norman (1963). N, E, O, A, and C correspond to Norman's factors IV (Emotional Stability, reversed), I (Surgency), V (Culture), II (Agreeableness), and III (Conscientiousness), respectively. See Digman (1990) for a discussion of other factor labels.

"while these two different measures each purport to measure 'Murray needs,' they are in fact not measures of the same concepts" (p. 526). These failures of convergent validity may be due to the different response formats of the tests; it is unclear from the data presented whether the problem lies with the EPPS or the ACL or both.

Correlations of ACL scales with measures of the five-factor model can be used to examine both structural and convergent validity. Previous research has shown that the Murray needs measured by the PRF are meaningfully related to the five factors (Costa & McCrae, 1988a). For example, needs for Achievement and Order are related to C, needs for Change and Understanding to O. The present study tests the hypothesis that the pattern of correlations between need scales and the five factors will be similar in the ACL. In addition, the magnitude of theoretically appropriate correlations can be used to assess the degree of convergent validity of ACL need scales.

One limitation of previous research on Murray needs and the five-factor model was an exclusive reliance on self-report instruments. Although Jackson (1984) has shown impressive evidence of cross-observer validity for the scales of the PRF, the relations between need scales and the dimensions of the five-factor model have not yet been examined across observers, and it is possible that the correlations are distorted by artifacts of self-report. In the present study, measures of the five factors derived from spouse and peer ratings are also used as criteria to evaluate the scales of the ACL.

Recovering the Five Factors in the ACL

We have suggested that correlations with measures of the five-factor model can address questions about the validity of ACL scales. A different question asks whether the five factors can be recovered from the ACL scales themselves. The 1983 edition of the ACL includes over 30 scales, covering many constructs beyond those encompassed by Murray's needs. If the five-factor model is in fact a comprehensive model of personality, it might be argued that the factors should be recoverable from ACL scales themselves. This hypothesis is suggested by Digman and Inouye (1986, p. 116):

A series of research studies of personality traits has led to a finding consistent enough to approach the status of law. The finding is this: If a large number of rating scales is used and if the scope of the scales is very broad, the domain of personality descriptors is almost completely accounted for by five robust factors.

The present article provides an opportunity to test this law.

In a recent article, Livneh and Livneh (1989) gave the 1965 version of the ACL (Gough & Heilbrun, 1965) to 143 human service providers. When the 23 ACL scales were factored, Livneh and Livneh were unable to interpret the resulting structure from the vantage point of the five-factor model and concluded that the model might be a method-specific phenomenon whose generalizability might not be as robust as initially claimed. The impact of this modest study was magnified by its citation in Digman's (1990) *Annual Review* chapter.

The Livneh and Livneh (1989) study had several methodological problems, however. The six-factor solution they reported

could hardly provide a reasonable test of the five-factor model, the inclusion of total number of adjectives checked by each person as a variable in Livneh and Livneh's analyses was inappropriate, and their identification of markers for each of the five factors was seriously flawed.² For example, Endurance, conceptually a marker of C, was used by Livneh and Livneh as a marker of N; their other marker of N was Self-Confidence, which (an item content analysis suggests) is more properly seen as an indicator of E.³

Marker scales should be known to be relatively pure indicators of the factor they are supposed to mark. To the extent that Livneh and Livneh's (1989) choices for N are incorrect, they obscure the identification not only of the N factor but also of the C and E factors. Because their factor analysis was interpreted solely in terms of these markers, it must have been misinterpreted; it would be reasonable to dismiss the study entirely.

Livneh and Livneh (1989) do raise an interesting question, however: Can the five-factor model be recovered from an analysis of ACL scales? Little would be learned from an analysis of the ACL adjectives themselves, because the structure of personality as reflected in adjectives is well established (Goldberg, 1989). However, the scales in the revised ACL (Gough & Heilbrun, 1983) may possess properties and reflect attributes of people that single adjectives do not. The scales were developed by rational and empirical strategies to represent psychological constructs that may not have parallels in lay vocabulary. Theoretical constructs from such sources as transactional analysis (Berne, 1961) and Welsh's (1975) orignence-intellectance theory may not fit within the five-factor model, and the inclusion of scales measuring them may give rise to new factors.

We present two studies which analyze the revised version of the ACL in terms of the five-factor model. In the first study, established markers, which are based on 112 ACL adjectives (John, 1990), for the five factors are included along with the standard ACL scales in an analysis of data from a college sample. In the second study, two independent measures of the five-factor model—bipolar adjective factors and NEO Personality Inventory factors—are jointly factored with ACL scales in an adult sample. The resulting factors are then correlated with peer and spouse ratings on the NEO Personality Inventory (NEO-PI; Costa & McCrae, 1985b) to address Livneh and Livneh's (1989) concern that the five factors may be method specific.

Factor analyses of the ACL are complicated by extensive item

² The inclusion of Number Checked is methodologically inappropriate because other scales are corrected for total endorsements; Number Checked thus cannot be correlated with other scales and must define its own factor. Gough and Heilbrun (1983) argue that Number Checked may have a substantive interpretation. It is difficult to evaluate this hypothesis using self-report data because relations among self-report scales may be due to method variance. When the self-reported Adjective Check List Number Checked scale was correlated with 100 spouse and 159 peer ratings on NEO Personality Inventory factors (see Study 2), the correlations were all nonsignificant ($r_s = -.09-.18$, all $p_s > .05$). Number Checked is thus treated as a methodological artifact in this article.

³ These rational interpretations are confirmed in the present study: See Table 2.

overlap between the scales. In the revised version, the 300 items are scored for 35 scales; the average item appears in 4.6 scales. To an unknown degree, the factor structure of the ACL will be influenced by item overlap. This item redundancy serves to inflate correlations between the scales and may distort multivariate analyses by violating the assumption of independent observations. However, correlations of the ACL scales with external criteria do not suffer from this problem and provide a better basis for interpreting these scales. Therefore, individual correlations of the ACL scales with the five factors are also presented for making substantive interpretations of the scales.

Study 1

Method

Subjects. Subjects consisted of 264 female and 150 male undergraduate volunteers (mean age 19.1 years, $SD = 3.15$), who received course credit for their participation (see Piedmont, 1989, for details).

Measures and procedures. As part of a larger study on motivation, all subjects completed the ACL in mixed-sex groups of from 5 to 20 people. Scores on each scale were residualized to adjust for gender and total number of items checked. As markers of the five factors, we used scales created by summing the relevant adjectives identified by a panel of judges familiar with the literature on the Big Five (John, 1990). These rational judgments were supported by empirical analyses (McCrae, 1990) demonstrating convergence of the scales with other measures of the five-factor model. These marker scales were also residualized to adjust for gender and total number of items endorsed.

Results and Discussion

The 35 ACL scales plus the 5 marker scales were factor analyzed using a principal-components extraction with varimax rotation.⁴ Six factors had eigenvalues greater than 1, and both five- and six-factor solutions were examined. Five of the factors were similar in both analyses; the sixth was defined solely by Welsh's (1975) A-1. Table 1 presents loadings, after varimax rotation, for the five-factor solution.

As can be seen in Table 1, the five rotated factors are clearly defined and easily identified by the markers. Each ACL scale shows a substantial loading on at least one of these dimensions. N is related to high Succorance and low Ideal Self scores; E is defined by the Dominance, Aggression, Exhibition, and Free Child scales; the Change, Creative Personality, and Welsh's (1975) A-2 scales define O; the Nurturance, Affiliation, Personal Adjustment, and Nurturant Parent scales, among others, have their primary loadings on A; and the Order, Achievement, Endurance, and Military Leadership scales, among others, mark C.

In general, results for the ACL need scales appear to replicate earlier findings using the PRF need scales (Costa & McCrae, 1988a). There are also striking resemblances to the factor structure of needs reported by Huba and Hamilton (1976) across several different instruments. They found three replicated factors, which they interpreted as achievement motivation, extraversion, and "a generalized motivation to care for other individuals" (Huba & Hamilton, 1976, p. 874). A fourth factor, not well replicated, had loadings on Autonomy and Change and resembled "what some authors in the past have called a 'bohemian-

ism' factor" (Huba & Hamilton, 1976, p. 874). These four factors correspond to C, E, A, and O.

Study 2

Despite their diverse theoretical origins, Study 1 suggested that the five-factor model can be recovered from the ACL scales when appropriate markers are included. In an attempt to demonstrate the generalizability of the previous findings across different data sources and populations of respondents, this study incorporates a sample of older adults, two independent markers of the five factors, and spouse and peer ratings.

Method

Subjects. Subjects were volunteer participants in the Augmented Baltimore Longitudinal Study of Aging. The Baltimore Longitudinal Study of Aging (BLSA; Shock et al., 1984) sample itself is composed of a predominantly White, community-dwelling group of people who have agreed to return for periodic biomedical and psychological testing. Most have at least a college degree and work in (or are retired from) scientific, professional, or managerial occupations. The Augmented BLSA consisted of a subset of BLSA participants, augmented by those of their spouses who agreed to complete questionnaires at home. Although this sample is not representative of the general population in education or occupation, comparisons show that it does not differ markedly from a national sample with regard to the three personality dimensions of N, E, and O (Costa et al., 1986). Valid ACL data were available for 247 men aged 21-93 ($M = 62.7$) and 198 women aged 19-93 ($M = 58.9$). Of this total, 410 had self-reports and 100 had spouse ratings on the NEO-PI; 159 had mean peer ratings on the NEO-PI provided by from one to four friends and neighbors. A subsample of 244 had self-ratings on the bipolar adjectives used to measure the five factors (McCrae & Costa, 1987).

Measures and procedures. The NEO Personality Inventory (NEO-PI; Costa & McCrae, 1985b) is a 181-item questionnaire developed through rational and factor-analytic methods to measure the five major domains of personality: N, E, O, A, and C. Items are answered on a 5-point scale ranging from *strongly disagree* to *strongly agree*, and scales are balanced to control for acquiescence. Internal consistency for the five domain scales ranges from .76 to .93, and scores for adults are extremely stable, with 3- to 6-year stability coefficients ranging from .63 to .83 (Costa & McCrae, 1988b). The NEO-PI Form R parallels the self-report version except that items are phrased in the third person. Reliability and validity coefficients are generally comparable to those found for self-reports (Costa & McCrae, 1985b). Factors from the NEO-PI provide somewhat better measures of the five factors than do the domain scales (McCrae & Costa, 1989) and will be used in all analyses.

A second set of measures of the five factors was derived from the 80 bipolar adjective scales described by McCrae and Costa (1987), which were also completed by a subset of the BLSA subjects.

The data were collected over a 4-year period. Peer ratings on the NEO-PI were completed in 1983, whereas self-report and spouse forms were answered in 1986. The ACL was given in 1987. The varying time

⁴ Two Adjective Check List scales were omitted from analyses: the Counseling Readiness scale (because it is different for men and women) and Number Checked (because it reflects primarily endorsement frequency rather than any substantive aspect of personality). Correlation of Counseling Readiness with the five factors in both studies showed it to reflect low E in men and low A in women.

Table 1
*ACL Scale Factor Loadings for Varimax-Rotated
 Five-Factor Solution in a Student Sample*

Scale	Factor				
	N	E	O	A	C
Marker scale					
Neuroticism (N)	.74	-.12	-.09	-.33	-.23
Extraversion (E)	-.05	.90	-.08	.12	-.11
Openness (O)	-.32	.23	.58	.14	.27
Agreeableness (A)	-.07	-.14	.00	.88	.07
Conscientiousness (C)	.01	-.14	-.15	.24	.79
ACL scale					
Unfavorable	.19	-.04	-.22	-.76	-.47
Favorable	-.26	.16	.16	.75	.51
Communality	.26	-.11	.13	.61	.40
Achievement	.00	.56	.04	.12	.73
Dominance	-.12	.87	.02	.10	.38
Endurance	-.09	.08	-.09	.22	.88
Order	-.09	-.13	-.20	.07	.87
Intracception	-.13	-.20	.24	.64	.54
Nurturance	-.10	-.11	.00	.92	.16
Affiliation	-.27	.19	-.03	.83	.17
Heterosexuality	-.14	.51	-.05	.66	-.09
Exhibition	-.07	.88	.02	-.03	-.23
Autonomy	-.02	.74	.22	-.46	-.03
Aggression	.15	.81	-.01	-.44	-.07
Change	.16	.58	.45	.22	-.33
Succorance	.45	-.49	-.23	-.19	-.40
Abasement	.32	-.80	-.08	.07	-.25
Deference	.05	-.78	-.25	.43	.12
Self-Control	-.07	-.85	-.14	.14	.31
Self-Confidence	-.18	.77	.13	.36	.32
Personal Adjustment	-.22	.11	.02	.77	.32
Ideal Self	-.60	.30	.20	.33	.43
Creative Personality	-.26	.52	.61	.06	.08
Military Leadership	.00	.07	.14	.44	.76
Masculinity	-.31	.66	.00	-.16	.39
Femininity	.20	-.10	.01	.64	.11
Critical Parent	.31	.55	-.05	-.61	.20
Nurturant Parent	-.33	.03	-.14	.74	.45
Adult	-.37	.03	.08	.30	.81
Free Child	-.21	.83	.25	.26	-.12
Adapted Child	.48	-.29	-.04	-.45	-.61
Welsh's A-1	-.37	.22	-.11	.12	-.47
Welsh's A-2	.14	.10	.67	-.37	-.36
Welsh's A-3	-.15	-.09	-.21	.76	.00
Welsh's A-4	-.18	-.07	.09	.10	.78

Note. $N = 414$. Loadings greater than $|\cdot 40|$ are given in boldface. ACL = Adjective Check List. Marker scales are from John (1990).

intervals between testing sessions are unlikely to distort relations among the variables (Costa & McCrae, 1985a); in fact, they provide a stronger, cross-occasion test of the hypotheses.

Results and Discussion

Again, all of the residualized ACL scales (with the exception of Counseling Readiness and Number Checked) plus scores on the five factors from the NEO-PI and the adjective rating scales were subjected to a joint factor analysis. Five varimax-rotated principal components accounted for 74% of the variance.⁵ Each of the five rotated factors was clearly identified by the two

marker scales for each of the domains, with loadings ranging from .68 to .81. Loadings for ACL scales were remarkably similar to those found in Study 1.⁶ Congruence coefficients (Wrigley & Neuhaus, 1955) between factor loadings for the ACL scales in the two studies were .95 for N, .94 for E, .90 for O, .92 for A, and .98 for C.

Factor scores from this analysis, which are based entirely on self-report data, were correlated with spouse and peer ratings on the NEO-PI, Form R. Each factor in the self-reports is significantly correlated with its corresponding factor in the spouse ratings ($r_s = .40-.59$, $N = 94$, $p < .001$) and in peer ratings ($r_s = .41-.71$, $N = 145$, $p < .001$). None of the 40 discriminant correlations exceeded .24 in absolute magnitude. These cross-observer findings demonstrate the robustness of the five-factor model across both instruments and information sources.

The factor structures in both Studies 1 and 2 are determined in part by item overlap in the ACL scales, so interpretation of these scales on the basis of their factor loadings is unwise. Table 2 presents correlations between NEO-PI factors and ACL scales; these correlations are not affected by item overlap. Comparison of Table 1 with Table 2 shows that the factor results are not entirely artifactual: For 22 of the 35 scales, the highest correlation in Table 2 is with the factor on which the scale chiefly loads in Table 1, so similar interpretations of most scales are suggested by both analyses.

For a few scales, however, there are important differences: Personal Adjustment, for example, loaded primarily on A in the factor analysis, but was most strongly correlated with the NEO-PI N factor; Aggression, which unexpectedly was a strong marker of E in factor analyses, is seen in correlations to be chiefly related to low A. In general, the ACL scales are apparently more multifactorial than the factor loadings would suggest. For example, the Affiliation scale contains items related to low N (contented, relaxed), and high E (active, sociable), A (cooperative, trusting), and C (self-controlled, mannerly). This item content is seen far more clearly in the correlations than in the factor loadings, which suggest Affiliation to be a relatively pure measure of A.

How closely do these correlations resemble those found in earlier studies relating the PRF to the five-factor model (Costa & McCrae, 1988a)? Huba and Hamilton (1976) quantified the estimate of structural similarity across instruments by correlating the corresponding entries in correlation matrices (after r -to- z transformation). The PRF and ACL have 12 need scales in common; the 60 correlations of ACL needs with the five factors were correlated with the 60 correlations of PRF needs to yield an intermatrix correlation of .81. Thus, the need scales of the ACL appear to show a very similar pattern of relations to the five factors across instruments.

Convergent validity is also assessed in terms of the magnitude of correlations, however. If all the correlations in Table 2 were halved, the same pattern would be seen, but the utility of

⁵ As in the previous analysis, a sixth factor had an eigenvalue greater than 1.0. After rotation, it contrasted Welsh's (1975) A-1 with Communality.

⁶ The full factor matrix is available from Paul T. Costa, Jr.

Table 2
Correlations of ACL Scales With NEO-PI Factors in an Adult Sample

ACL scale	Factor				
	N	E	O	A	C
Unfavorable	.41 ^{a,b}	-.20	.05	-.29 ^a	-.33 ^b
Favorable	-.44 ^{a,b}	.31 ^b	.04	.21 ^a	.30
Communality	-.03	.06	.01	.18 ^a	.14
Achievement	-.24	.38 ^{a,b}	.06	-.23 ^b	.44 ^{a,b}
Dominance	-.24	.51 ^{a,b}	.10	-.33 ^b	.22
Endurance	-.33 ^a	.12	-.10	-.02	.53 ^{a,b}
Order	-.31 ^a	.06	-.16	.01	.51 ^{a,b}
Intracception	-.34 ^a	.08	.06	.30 ^a	.33 ^{a,b}
Nurturance	-.29 ^a	.19 ^b	-.12	.46 ^{a,b}	.18
Affiliation	-.48 ^{a,b}	.30 ^b	-.12	.33 ^{a,b}	.19
Heterosexuality	-.09	.50 ^{a,b}	.03	.06	-.10 ^b
Exhibition	.02	.44 ^{a,b}	.21 ^b	-.28 ^b	-.14
Autonomy	.09	.15 ^b	.18 ^b	-.54 ^{a,b}	-.12
Aggression	.23 ^a	.28 ^{a,b}	.22	-.49 ^{a,b}	-.08
Change	.10	.34 ^{a,b}	.34 ^{a,b}	-.12	-.24 ^{a,b}
Succorance	.50 ^{a,b}	-.21	.03	.11 ^b	-.29 ^b
Abasement	.32	-.37 ^{a,b}	-.10	.39 ^{a,b}	-.11
Deference	-.08	-.21 ^b	-.24 ^b	.48 ^{a,b}	.10
Self-Control	-.12 ^a	-.37 ^{a,b}	-.28 ^b	.34 ^b	.16
Self-Confidence	-.31 ^a	.51 ^{a,b}	.10	-.12 ^b	.24
Personal Adjustment	-.40 ^{a,b}	.27 ^b	-.06	.29 ^a	.29 ^b
Ideal Self	-.46 ^a	.29 ^b	.11 ^b	.07	.26
Creative Personality	-.19	.26 ^b	.42 ^{a,b}	-.07	.04
Military Leadership	-.35 ^{a,b}	.19	-.03	.06	.44 ^{a,b}
Masculinity	-.24	.32 ^b	-.01	-.44 ^{a,b}	.13
Femininity	.03	.16	-.03	.32 ^{a,b}	.04
Critical Parent	.27 ^a	.06	.15	-.55 ^{a,b}	.03
Nurturant Parent	-.47 ^{a,b}	.22	-.15	.28 ^a	.35 ^{a,b}
Adult	-.49 ^{a,b}	.07	-.06	.12	.46 ^{a,b}
Free Child	-.16	.49 ^{a,b}	.28 ^b	-.12	-.05
Adapted Child	.56 ^{a,b}	-.24	.10	-.04	-.37 ^a
Welsh's A-1	-.04	.17	.02	-.12	-.35 ^{a,b}
Welsh's A-2	.27 ^a	-.21	.30 ^{a,b}	-.19	-.29 ^a
Welsh's A-3	-.30 ^b	.19 ^b	-.18	.37 ^{a,b}	.07
Welsh's A-4	-.36 ^{a,b}	-.01	-.08	.04	.42 ^{a,b}

Note. $N = 410$. $|r| > .10$, $p < .05$; $|r| > .13$, $p < .01$; $|r| > .16$, $p < .001$. ACL = Adjective Check List; NEO-PI = NEO Personality Inventory; N = Neuroticism, E = Extraversion; O = Openness to Experience; A = Agreeableness, C = Conscientiousness.

^aSignificant in replication using spouse ratings, $N = 100$. ^bSignificant in replication using mean peer ratings, $N = 159$.

ACL scales might well be questioned. In fact, the correlations in Table 2 are generally substantial; 12 of the 15 need scales and 14 of the 20 other scales show absolute correlations of .40 or higher. The footnotes in Table 2 report the results of parallel analyses using spouse and peer ratings on the NEO-PI factors. These correlations provide additional evidence of validity for ACL scales across observers.

General Discussion

Previous studies on the ACL (Fiske, 1973; Livneh & Livneh, 1989) raised questions about the construct validity of scales to measure Murray needs and about the comprehensiveness of the five-factor model. The present results provide evidence for the validity of ACL need scales (and thus, the viability of the self-report adjective checklist method) by showing substantial and

meaningful correlations of the scales with measures of the five-factor model that parallel those found using a different instrument, the PRF. Furthermore, they support the comprehensiveness of the five-factor model by confirming Digman and Inouye's (1986) prediction that analyses of a broad set of rating scales, such as those in the ACL, will reveal the five familiar factors.

Perhaps the most valuable aspect of the present research is the opportunity it affords to interpret ACL scales within the five-factor framework. These interpretations can illuminate previous research and lay a basis for a more informed use of ACL scales in the future. In the case of the Murray need scales, the correlations in Table 2 constitute a replication of earlier work relating motives to the traits of the five-factor model (Costa & McCrae, 1988a) and are chiefly of interest in pinpointing subtle differences in the ways the needs are operationalized

in different instruments. In the case of the topical, transactional analysis and oridence-intellectance scales, the correlations in Table 2 are particularly informative because relatively little research on the validity of these scales has been published.

Note that locating scales within the five-factor framework is not reductionistic; the fact that ACL scales are correlated with the five factors does not mean that they are nothing but combinations of the factors. Conceptually, individual scales may contribute uniquely to the interpretation of the factors: Links to the Murray needs demonstrate that the factors have motivational aspects that might not have been apparent from a consideration of trait adjectives. Empirically, individual scales may also contain specific variance that is unrelated to any general factor but that may have predictive utility (cf. Mershon & Gorsuch, 1988). Relating scales to the five-factor model provides a general orientation to their content, a useful first step in their interpretation.

Murray's need scales. Previous research (Costa and McCrae, 1988a) has shown that the need scales of the PRF can be meaningfully classified within the five-factor model; the correlations in Table 2 generally parallel those findings. However, the overall convergence should not be construed as meaning the two sets of scales are interchangeable. There are also substantive differences between the PRF and ACL need scales that carry important implications for personality assessment.

Such differences are particularly notable for two of the needs. The PRF Affiliation scale is a relatively pure measure of E, whereas the Affiliation scale of the ACL also includes elements of A and—somewhat surprisingly—low N. The ACL items considerate, cooperative, and good-natured reflect the A component; items such as contented, mature, optimistic, and relaxed reflect low N. Apparently Jackson (1967) conceived of Affiliation solely in terms of gregariousness, whereas Gough and Heilbrun (1983) saw prosocial and psychologically adjusted aspects as well. These conceptual differences may account for the relatively low convergent correlations ($r_s = .28$ and $.23$ for men and women) between these scales reported by Bessmer and Ramanaiah (1981), and they illustrate the point that literature reviewers and meta-analysts need to group scales not on the basis of names, but on the basis of external correlates.

The PRF Autonomy scale is related primarily to O and seems to represent nonconformity and independence, whereas the ACL scale is related chiefly to low A (ACL items include aggressive, argumentative, assertive, arrogant, hostile, and hard-headed). Both nonconformity and argumentativeness are ways of asserting autonomy, but they are distinctly different ways. These differences underscore the need for researchers to choose the scale that captures that aspect of the need they wish to measure and to interpret their findings accordingly.

Topical scales. This group of scales includes Counseling Readiness, Self-Control, Self-Confidence, Personal Adjustment, Ideal Self, Creative Personality, Military Leadership, Masculinity, and Femininity. Although not drawn from any single theory or context, the aim of these topical scales is to provide insights into important aspects of interpersonal behavior (Gough & Heilbrun, 1983).

Self-Confidence, Ideal Self, and Personal Adjustment are all positively related to E and negatively related to N, a combination of traits that predicts psychological well-being (Costa &

McCrae, 1980). As in earlier research (McCrae, 1987), the Creative Personality scale is related chiefly to O. The Military Leadership scale was developed using American and Italian samples of officer-training candidates who were rated on their performance by superiors. Apparently, adjusted and conscientious officers are most successful in giving and carrying out orders within an established hierarchy.

Masculinity is related to low A and high E and thus corresponds to dominance in the interpersonal circumplex; Femininity is related chiefly to A. These associations have been reported previously by Wiggins (1979) and represent a conception of masculinity in terms of power and leadership and of femininity in terms of love and nurturance. Note, however, that other theorists select traits from other domains to distinguish men and women: The Femininity factor of the Guilford-Zimmerman Temperament Scale emphasizes fearfulness and phobias and is related to high N (Costa & McCrae, 1985a); the Stereotypic Femininity factor of the Minnesota Multiphasic Personality Inventory (MMPI) focuses on aesthetic interests and is most highly correlated with O (Costa, Zonderman, McCrae, & Williams, 1985). The concept of masculinity/femininity is not unitary; users of the ACL need to understand the specific conceptions embodied in these scales.

One scale, Self-Control, shows puzzling correlations. The term *self-control* probably suggests to most psychologists a tendency to be self-disciplined, persistent, and capable of inhibiting impulses. These traits are aspects of C and perhaps low N. It is therefore surprising that the ACL Self-Control scale is related chiefly to A (mild vs. argumentative) and low E (quiet vs. outspoken). Passivity, inhibition, or meekness might be more descriptive labels for this scale.

Transactional analysis scales. The five scales in this cluster—Critical and Nurturant Parent, Adult, and Free and Adapted Child—were developed to reflect the five ego states associated with interpersonal behavior as outlined by Berne (1961). In theory, these states characterize all people at different times in interpersonal transactions; they are transient states, not stable traits. As the manual shows, however, scores on these ACL scales are relatively stable, with 6-month test-retest correlations ranging from .64 to .82. The scales could perhaps be understood as trait analogues of the ego states, and scores might be interpreted as the tendencies to manifest one or another ego state.

Viewed in these terms, most of the Transactional Analysis (TA) scales appear to be meaningfully correlated with the five factors. People who are antagonistic tend to act as critical and punitive parents; those who are agreeable, stable, and conscientious act as nurturant parents. Men and women who are well adjusted and conscientious can readily take the role of the mature adult; those who are extraverted and open show the spontaneity, warmth, and energy ascribed to the free child. The Adapted Child scale, however, is more problematic. In TA theory, the adapted child acts in response to the parents—complying or whining or withdrawing, as experience has taught is most effective. Presumably this state would vary from person to person, reflecting different histories of parent-child relations. The correlations of ACL Adapted Child show that this scale

measures high N and low C, a combination that would probably be adaptive for relatively few children.

Origence-intellectance scales. The four scales in this group are based on a conceptualization of creativity (or origence) and intelligence (or intellectance) as structural aspects of personality. Origence and intellectance are viewed as orthogonal abilities; combinations of high and low standing on the two dimensions yield four groups thought to have distinctive personality configurations.

According to the correlations in Table 2, creative but unintelligent people (high scorers on Welsh's A-1) are disorganized; creative and intelligent people (high A-2) are maladjusted, open, and disorganized; uncreative and unintelligent people (high A-3) are adjusted and agreeable; and uncreative but intelligent people (high A-4) are adjusted and conscientious. Although the first and last of these four descriptions may seem plausible, the others do not. In other research, only O has shown consistent relations to creativity (McCrae, 1987); C is often related to self-reported or rated intelligence. Correlations with N and A are unexpected and call into question the validity of some of the Welsh scales.

The scales of the ACL represent a wide variety of theoretical perspectives and scale construction strategies; what they share is the use of adjectives to define a psychological construct. It has been clear for some time that English language trait adjectives can be understood in terms of five basic dimensions. The present study suggests that combinations of adjectives yield combinations of these same five factors—not new, emergent factors. Beyond the ACL, adjective scales are used to measure constructs as varied as mood (McNair, Lorr, & Droppleman, 1971) and Adlerian social interest (Crandall, 1975). Perhaps all such scales can be understood in terms of the five-factor model.

Correlation of a scale with measures of the five basic factors of personality provides an efficient way to understand its psychological meaning and orient it in a widely shared conceptual system. Because the five-factor model is comprehensive, its factors should form appropriate convergent and discriminant criteria for the evaluation of most personality constructs. Significant correlations of a trait with conceptually related factors is rarely sufficient to establish its construct validity, but it is a useful first step. Failures to find such predicted relations can alert the investigator to potential problems in validity. The five-factor model is thus more than a taxonomy of traits; it can also be used as an integral part of the construct validation process.

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