

## An Assessment of the Edwards Personal Preference Schedule From the Perspective of the Five-Factor Model

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We examined the validity of need scales of the Edwards Personal Preference Schedule (EPPS) by correlating them with a measure of the five basic factors of personality; we also considered test format as a possible source of invalidity. Three hundred thirty (223 women, 107 men) undergraduate students completed both the NEO Personality Inventory (NEO-PI)—a measure of the five factors—and one of two versions of the EPPS. Results show that both ipsative and normative versions of the EPPS could be meaningfully interpreted within the five-factor model, although the ipsative, forced-choice format of the standard EPPS apparently lowered validity coefficients and decreased convergent and discriminant validity. We argue that the five-factor model can provide a useful interpretive context for evaluating many clinical measures.

The most popular self-report measure of Murray's (1938) needs is the Edwards Personality Preference Schedule (EPPS; Edwards, 1959). The EPPS is one of the tests most widely used by clinical psychologists (Lubin, Larsen, & Matarazzo, 1984) and by counseling psychologists in university and college settings (Watkins & Campbell, 1989). Buros (1978) listed it among the 10 tests most frequently cited in the research literature. Yet despite such wide usage, research has been inconsistent in finding acceptable convergence between the EPPS scales and other measures of Murray's needs, such as the Personality Research Form (PRF; Jackson, 1984) and the Adjective Check List (ACL; Gough & Heilbrun, 1965).

In the one study that compared the EPPS to the PRF, Edwards, Abbott, and Klockars (1972) found convergent coefficients between the EPPS and similarly named PRF scales as low as .25 (median = .53). Several studies have compared

the ACL need scales with the EPPS, and the lack of correspondence has called into question the validity of both instruments. As Wohl and Palmer (1970, p. 526) pointed out, "... while these two different measures each purport to measure 'Murray needs', they are in fact not measures of the same concepts. The scales show only small empirical relationships, and one cannot use them interchangeably."

This fact is particularly striking given the EPPS's and ACL's common theoretical heritage. Based on a reading of Murray (1938), Edwards created definitions for 15 of the needs, from which items were rationally developed. The ACL items for each of the scales were selected by a panel of judges who read Edwards's definitions of each of the needs (Heilbrun, 1959). Apparently, this theoretical overlap does not guarantee that these scales assess the same constructs. A review of the relations between the EPPA and the ACL scales in six different samples (Bouchard, 1968; Heilbrun, 1958; Megargee & Parker, 1968; Wohl & Palmer, 1970) showed convergent correlations ranging from  $-.15$  to  $.62$  (median =  $.26$ ). Although many of these correlations are statistically significant, most of them are too low to allow the inference of equivalence between corresponding constructs. Is the ACL or the EPPS a flawed instrument, or are both flawed instruments?

In this article, we address two issues. First, we evaluate the construct validity of EPPS scales by examining their correlations with measures of the five basic dimensions of personality (Digman, 1990; John, 1989; McCrae & Costa, 1985, 1989a, 1989b). The five factors of Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A), and Conscientiousness (C) provide a theoretical and empirical framework for conducting systematic construct validation studies. Both conceptual correspondences and prior empirical results suggest that measures of these dimensions are appropriate criteria for assessing the validity of need scales (Costa & McCrae, 1988a). Second, we investigate one possible source of lowered validity: the forced-choice, ipsative format of the EPPS. Comparison of the standard version with a normative, Likert-format version of the EPPS allows an assessment of the effect of test format on correlations with external criteria.

#### THE RELATION BETWEEN TRAITS AND NEEDS

It may not be immediately obvious that a comprehensive measure of personality traits should be relevant to the construct validation of measures of needs. However, both traits and needs concern relatively enduring individual differences in predispositions to think, feel, and act, and most traits have motivational aspects (Costa & McCrae, 1988a). Some needs may reflect combinations of the five factors. For example, Edwards's definition of *Autonomy* includes needs for independent thinking and unconventionality, which are associated with O;

need to criticize those in positions of authority, which is characteristic of low A; and need to avoid responsibilities and obligations, which should be related to low C. However, for most of the EPPS need scales it is possible to formulate specific hypotheses.

Individuals high in E are sociable, assertive, and fun loving; we can predict that they would have high needs for Affiliation, Dominance, Exhibition, and Heterosexuality. Openness to experience implies interest in variety and intellectual curiosity, so individuals high in O should have needs for Change and Intraception. Agreeable individuals are loving and submissive (McCrae & Costa, 1989c), and thus should show needs for Nurturance and Deference; disagreeable individuals (low A) should have high needs for Aggression. Conscientiousness is seen in persistent striving for goals and in careful organization; C should be related to needs for Achievement, Endurance, and Order.

Of the five factors, N is least relevant to needs, because it consists chiefly of the disposition to experience negative affects, and individuals do not normally have a need to experience distress. However, Edwards (1959, p. 11) defined *Abasement* as the need "to feel guilty when one does something wrong . . . to feel depressed by inability to handle situations, to feel timid in the presence of superiors, to feel inferior," and thus Abasement should be related to N. Furthermore, because they so often feel helpless and unhappy, high N individuals should be high in the need for Succorance.

Most of these hypotheses were supported in previous research (Costa & McCrae, 1988a; Piedmont, McCrae, & Costa, 1991) that has shown meaningful links between the five factors and the need scales of both the PRF and the ACL. If the EPPS scales are valid measures of Murray's needs, they should show similar correlations. If they do not, the problem may lie in the unusual format of the EPPS.

#### FORCED-CHOICE RESPONSES AND IPSATIVE SCORING

The EPPS consists of 135 distinct statements, 9 for each of 15 of Murray's needs. Statements for each need were matched with statements from every other need on the basis of social desirability ratings to form the 225 forced-choice items in the measure.

Measures that use a forced-choice format can pose problems in assessment. For any given item, the degree to which a subject perceives the two statements to be equally applicable creates difficulty in the subject's ability to select a response. If both statements are equally valid, choice will be more a function of chance than actual preference (Levonian, Comrey, Levy, & Procter, 1959; Saltz, Reece, & Agar, 1962). For example, if people are equally high on the needs for Order and Endurance and are given an item that contrasts statements from each

of these scales, which would they select as being more characteristic? Both are equally relevant, so the selection would be the result of either a momentary preference, mood, or guessing.

This problem becomes particularly acute when the scales assess positively related constructs. Order and Endurance, for example, are both aspects of C, and an individual high (or low) in C will tend to be high (or low) in both these needs, and thus be unable to make reliable choices whenever presented with items which pair them. The more items that contrast such equally preferred statements, the less reliable the measure is likely to become.

Each item in the EPPS is scored for both of the needs represented, resulting in an ipsative instrument. For example, when faced with an item pairing an Order and an Endurance statement, the respondent who chooses the former simultaneously gains a point for the Order scale and loses one point for Endurance. With ipsative instruments, the sum of the scores obtained over the attributes measured for each person is a constant. Unlike the more common normative measure in which the scores of respondents are distributed around a population mean, an ipsative measure yields estimates that are relative to the scores of the other variables measured within the person; scores are distributed around the individual's mean score (Hicks, 1970), so a high score on one scale forces lower scores on others. This makes any interindividual comparisons problematic (Fedorak & Coles, 1979; Hicks, 1970) because the same score can have different meanings for different people. When respondents score low on one EPPS need scale, we have no way of knowing whether it is because they are low on that need or merely because they are higher on other needs.

Furthermore, Radcliffe (1963) pointed out that ipsatization forces the set of EPPS scales into certain mathematical relations with each other and with external criteria. Despite whatever theoretical and empirical relations may be expected, the average correlation among the EPPS scales is  $-.07$ , and correlations between the set of 15 EPPS scales and any external criterion must sum to zero. This problem is highlighted when the 15 scales are to be correlated with a criterion that should be positively (or negatively) related to many of them; the observed associations will be distortions of the true relationships. For example, we might expect theoretically that Achievement, Order, and Endurance will all be positively related to a measure of C, and that the other needs would be unrelated to C. We would therefore expect that the average correlation of the 15 EPPS scales with a measure of C would be low but positive. This pattern of results is mathematically impossible on the EPPS, because if some correlations are positive, then the remaining ones must be negative; the sum of the correlations must be zero.

Although we know that some distortion is guaranteed by the EPPS format, we do not know how serious a problem it is or how it affects the interpretation of individual EPPS scales. In order to evaluate the effects of the forced-choice ipsatized format, two versions of the EPPS are used: the standard instrument

(Edwards, 1959) and the normative version used by Horst and Wright (1959) and Sherman and Poe (1972). By evaluating differences in the pattern of theoretically relevant correlations between measures of the five basic personality factors and the two versions of the EPPS scales, we can evaluate the nature and magnitude of the distortions introduced by the ipsatization and the validity of the standard EPPS scales.

## METHOD

### Subjects

Subjects for this study consisted of 330 undergraduate students (223 females, 107 males) at a large, private northeastern university. Ages ranged from 17 to 22 ( $M = 18.3$ ;  $SD = .89$ ). All subjects volunteered and received course credit for their participation.

### Measures and Procedures

As already noted, the EPPS (Edwards, 1959) is a measure of 15 of Murray's (1938) needs. The EPPS statements comprising each of the 225 forced-choice items were matched on social desirability. The instrument has been used extensively for 30 years in clinical, counseling, and research contexts; Heilbrun (1972) provided a review. We refer to the standard EPPS as the *ipsative form*. A second version of the EPPS, referred to as the *normative form*, was also included. It comprised the 135 distinct EPPS statements presented individually to be rated on a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5; cf. Horst & Wright, 1959).

The NEO-PI (Costa & McCrae, 1985, 1989) is a 181-item questionnaire developed through rational and factor analytic methods to measure the five major dimensions, or domains, of personality: N, E, O, A, and C. Items are answered on a 5-point scale ranging from *strongly disagree* (1) to *strongly agree* (5), and scales are balanced to control for the effects of acquiescence. Internal consistency for the five domain scales ranges from .76 to .93, and scores for adults are stable, with 3- to 6-year retest coefficients ranging from .63 to .83 (Costa & McCrae, 1988b). In this sample, alpha coefficients for N, E, O, A, and C were .91, .87, .86, .78, and .87, respectively.

The NEO-PI has been extensively validated in studies on normal volunteers with other self-report inventories (e.g., McCrae & Costa, 1989b) and with alternative measures of the five-factor model (e.g., Goldberg, 1989; Trapnell & Wiggins, 1990). Scales have shown evidence of convergent and discriminant validity across instruments, methods, and observers and have been related to a number of life outcomes including somatic complaints, coping with stress, and

response to psychotherapy (Costa & McCrae, 1989; Miller, 1991). Reviews of the instrument are provided by Hogan (1989) and Leong and Dollinger (1990).

Subjects completed the measures in groups of 5 to 20. All subjects received the NEO-PI first and then either the standard form of the EPPS or the normative form. Groups were randomly assigned to receive one of the two forms of the EPPS.

## RESULTS

Table 1 provides means and standard deviations for men and women for all 15 needs. Comparisons with the original college norms (Edwards, 1959, Table 2, p. 10) show males in this sample to be more than one half of a standard deviation higher on Succorance and more than one half of a standard deviation lower on Deference and Dominance. Females were similarly lower on Deference and Order and higher on Succorance. Of the 12 gender differences noticed originally, only 4 are found here (Achievement, Affiliation, Succorance, Nurturance). Similar changes over time have been reported by York (1990). Mean scores on the NEO-PI scales were all within the normal ranges for college students (Costa & McCrae, 1989). Descriptive statistics and alpha reliabilities

TABLE 1  
Descriptive Statistics for EPPS Ipsative and Normative Forms

EPPS Scale	Ipsative				Normative					
	Males <sup>a</sup>		Females <sup>b</sup>		Males <sup>c</sup>			Females <sup>d</sup>		
	M	SD	M	SD	M	SD	$\alpha$	M	SD	$\alpha$
Achievement	15.8	3.8	14.1	3.9	37.4	3.9	.72	36.3	4.7	.77
Deference	8.8	3.0	8.5	3.2	31.9	4.1	.63	31.6	3.4	.47
Order	8.4	4.5	8.2	4.5	29.2	5.8	.80	30.7	6.3	.83
Exhibition	15.9	3.3	15.1	3.4	31.5	4.9	.72	30.8	5.1	.75
Autonomy	15.1	4.1	13.8	3.9	32.9	4.1	.65	31.4	3.8	.62
Affiliation	14.6	4.0	18.1	4.6	36.1	4.4	.77	37.6	3.9	.72
Intracception	15.7	4.3	16.4	4.2	35.3	5.8	.90	35.0	5.1	.86
Succorance	13.6	5.2	15.6	5.1	33.4	4.0	.72	34.3	4.7	.82
Dominance	13.6	4.5	13.0	5.0	29.9	5.2	.78	29.2	5.3	.81
Abasement	13.6	5.5	13.6	4.6	27.8	4.1	.52	27.4	4.3	.58
Nurturance	15.9	4.9	18.4	4.4	36.2	4.4	.85	37.7	4.2	.85
Change	15.7	4.9	16.0	4.7	34.9	4.7	.75	35.7	4.2	.71
Endurance	11.8	5.8	10.7	4.8	32.6	5.1	.77	31.9	5.0	.73
Heterosexuality	17.9	5.8	16.4	5.1	36.6	4.3	.77	34.7	4.9	.80
Aggression	13.5	5.1	12.2	4.7	27.4	4.9	.70	25.2	5.6	.79

Note. EPPS ipsative form is the standard 225-item questionnaire. The normative form comprises the 135 distinct EPPS items presented on a 5-point Likert scale.

<sup>a</sup>n = 50. <sup>b</sup>n = 114. <sup>c</sup>n = 57. <sup>d</sup>n = 109.

are also presented in Table 1 for the normative form of the EPPS. Deference, Autonomy, and Abasement scales have relatively low internal consistency, suggesting heterogeneous item content; all the other scales show acceptable reliability.

Table 2 presents the correlations between the ipsative EPPS and the NEO-PI domain scales. All 14 of the hypothesized relations are in the predicted direction, and 13 of them are significant. N is the largest correlate of Succorance and Abasement; E of Exhibition, Dominance, and Heterosexuality; O of Intraception and Change; A of Nurturance and (low) Aggression; and C of Endurance. These findings offer some support for the validity of EPPS need scales.

But the magnitude of the convergent correlations is relatively small (mean  $r = .30$  after  $z$  transformation), and a closer examination of Table 2 reveals some unexpected relations in the correlation matrix. For example, need for Achievement is not significantly correlated with C, the Affiliation and Exhibition scales are only weakly related to E, and Order has an unexpectedly strong negative correlation with E.

A stronger and more meaningful pattern of associations is found in Table 3, which presents the correlation matrix for the normative version of the EPPS. As in Table 2, 13 of the 14 hypothesized correlations are significant; the one failure of convergent validity in Table 3 is the lack of the hypothesized association

TABLE 2  
Correlations of EPPS Ipsative Form Scales With NEO-PI Domain Scales

EPPS Scale	NEO-PI Domain Scale				
	N	E	O	A	C
Achievement	-.05	-.01	.08	-.16*	.10
Deference	-.27***	-.25***	-.08	.33***	.11
Order	.09	-.39***	-.36***	-.20**	.35***
Exhibition	.02	.27***	.16*	-.23**	-.05
Autonomy	-.20**	.02	.06	-.21**	-.22**
Affiliation	.03	.19**	.04	.39***	-.15
Intraception	.06	-.16*	.24**	.14	.01
Succorance	.30***	-.14	-.02	.16*	-.17**
Dominance	-.24**	.41***	-.14	-.15	.12
Abasement	.31***	-.22**	-.09	.03	-.05
Nurturance	-.03	.00	.19**	.44***	-.14
Change	-.18*	.15	.24**	.12	-.08
Endurance	-.23**	-.12	-.17*	.04	.32***
Heterosexuality	.07	.17*	.01	-.16*	-.06
Aggression	.19**	.04	-.09	-.52***	-.06

Note.  $N = 164$ . Hypothesized convergent correlations are given in boldface; no hypothesis was made concerning Autonomy.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

TABLE 3  
Correlations of EPPS Normative Form Scales With NEO-PI Domain Scales

EPPS Scale	NEO-PI Domain Scale				
	N	E	O	A	C
Achievement	.10	<b>.31***</b>	<b>.28***</b>	-.07	<b>.28***</b>
Deference	.12	.15*	-.03	.07	.20**
Order	-.05	.11	<b>-.32***</b>	.03	<b>.68***</b>
Exhibition	<b>.23**</b>	<b>.36***</b>	.20**	-.17*	.01
Autonomy	.16*	-.09	.41***	<b>-.26***</b>	<b>-.26***</b>
Affiliation	-.08	<b>.54***</b>	<b>.36***</b>	<b>.44***</b>	.24**
Intracception	.20**	.09	<b>.51***</b>	.02	.00
Succorance	<b>.36***</b>	<b>.26***</b>	-.03	-.01	.02
Dominance	.20**	<b>.33***</b>	-.01	<b>-.33***</b>	.13
Abasement	<b>.46***</b>	-.09	-.03	.07	-.15
Nurturance	.05	.45***	<b>.37***</b>	<b>.35***</b>	.24**
Change	-.03	<b>.33***</b>	<b>.38***</b>	.15	.14
Endurance	-.09	.18*	.05	.03	<b>.63***</b>
Heterosexuality	.12	<b>.34***</b>	.20**	-.04	-.05
Aggression	<b>.47***</b>	-.05	-.09	<b>-.53***</b>	<b>-.22**</b>

Note.  $N = 166$ . Hypothesized convergent correlations are given in boldface; no hypothesis was made concerning Autonomy.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

between Deference and A, which may be due to the unreliability of the Deference scale, especially in women (see Table 1). A comparison of the boldface correlations in Tables 2 and 3 shows that the convergent correlations for the normative form are higher than those for the ipsative form in 11 of 14 cases, and  $z$  tests for differences between correlations show that they are significantly higher in 6 instances (Achievement, Order, Affiliation, Intracception, Endurance, and Heterosexuality). By contrast, only 1 of the hypothesized correlations is significantly higher in the ipsative form (Deference). The mean convergent correlation in Table 3 is .43. The difference between the normative and ipsative forms is dramatic in some cases: The correlation between Affiliation and E increases from .19 (Table 2) to .54 (Table 3); the correlation between Endurance and C increases from .32 to .63. It appears that the standard format of the EPPS seriously limits the magnitude of validity coefficients.

Several of the correlations in Table 3 were not hypothesized, but none are counterintuitive. Affiliation and Dominance are both related to E as hypothesized, but they also show substantial and opposing relations to A. These correlations are consistent with research on the interpersonal circumplex, which shows that affiliation is an agreeable and dominance a disagreeable form of E (McCrae & Costa, 1989c). The secondary association of Aggression with N is understandable because anger—the affect associated with aggression—is also a distressing emotional state.



## DISCUSSION

This study was intended to evaluate the construct validity of scales in the EPPS, an instrument widely used in counseling and clinical psychology. Such an assessment was needed because there have been persistent problems with the convergent validity of EPPS scales and because the forced-choice, ipsative format of the instrument has been criticized by psychometricians.

Correlations between the NEO-PI and the normative scales replicated previous findings using the NEO-PI and the PRF and ACL need scales (Costa & McCrae, 1988a; Piedmont et al., 1991). Edwards's conceptions of Murray's needs, as operationalized in the items, apparently are close to the conceptions of Gough and Heilbrun (1965) and Jackson (1984). However, when arranged in forced-choice pairs and ipsatively scored, these items form scales that have substantially altered psychometric properties. Validity coefficients are markedly reduced for many of the scales, and it seems likely that the relatively low correlations between EPPS need scales and the need scales of the PRF and ACL are due at least in part to problems in measurement introduced by the format of the EPPS.

In addition, the pattern of correlations between the NEO-PI and the standard EPPS suggests that ipsative scoring also introduces qualitative changes that distort the interpretation of some EPPS scores. In our sample, this is seen most clearly for Affiliation and Order. The definition of the Affiliation scale includes "to form new friendships, to make as many friends as possible, to do things with friends rather than alone" (Edwards, 1959, p. 11). It is easy to infer from this definition that individuals scoring high on EPPS Affiliation would be very extraverted, but in fact the association between this scale and E is only .19 for our sample. Again, it might be supposed that the EPPS Order scale would be a pure measure of C, but an examination of Table 2 shows that high scorers on this scale are not only conscientious, but also disagreeable, closed, and introverted.

It might be argued that the higher correlations found between the normative form of the EPPS and the NEO-PI are artifacts of method. The NEO-PI and the normative version of the EPPS do share the same Likert format, but this, in itself, cannot explain the generally higher correlations seen in Table 3. A shared acquiescence bias would artificially increase correlations, but it cannot operate here because the NEO-PI scales have balanced item keying. It is more plausible to argue that the correlations in Table 3 are inflated by socially desirable responding, which the standard form of the EPPS was designed to reduce. We did not address this issue, but recent research has called into question the premise that self-report measures are seriously contaminated by socially desirable responding (McCrae & Costa, 1983; McCrae et al., 1989; see also Nicholson & Hogan, 1990). In particular, Piedmont et al. (1991) showed that ACL measures of Murray's needs were appropriately related to spouse and peer

ratings of the five major dimensions of personality; these cross-method correlations cannot be explained in terms of self-report artifacts.

Our study is potentially useful not only as an assessment of one widely used instrument, but also as an illustration of an approach to construct validation that could be applied to the evaluation of many kinds of assessment instruments, including projective and cognitive measures of personality. A conceptual analysis of the various constructs the instrument is intended to measure could generate a set of hypotheses about their relations to the five factors; observed associations would then be compared to these expectations to evaluate the instrument. The results provide a conception of what it measures in terms of a broad taxonomy of personality traits.

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