Person. individ. Diff. Vol. 12, No. 9, pp. 887–898, 1991
Printed in Great Britain

0191-8869/91 $3.00 + 0.00
Pergamon Press plc

FACET SCALES FOR AGREEABLENESS AND CONSCIENTIOUSNESS: A REVISION OF THE NEO PERSONALITY INVENTORY*

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(Received 4 December 1990)

Summary—The NEO Personality Inventory (NEO-PI) is intended to operationalize the five-factor model of personality, both at the level of broad factors or domains and at the level of more specific traits or facets of each domain. However, only facets of three of the domains are currently measured. In this paper we describe minor modifications to the facet scales of Neuroticism, Extraversion, and Openness, and the development of new scales to measure facets of Agreeableness and Conscientiousness. Conceptual distinctions within these domains were suggested by a review of the literature, and pilot studies provided preliminary evidence for the validity of new facet scales. Item analyses in a large and diverse sample ($n = 1539$) of adult men and women were used to finalize item selection and to confirm the structure of the Revised NEO-PI (NEO-PIR) at both the item and the scale level. Correlations of the NEO-PIR with a variety of other self-report scales in a second sample of 394 men and women provided evidence on the convergent and discriminant validity of scales to measure Trust, Straightforwardness, Altruism, Compliance, Modesty and Tender-Mindedness as facets of Agreeableness, and Competence, Order, Dutifulness, Achievement Striving, Self-Discipline, and Deliberation as facets of Conscientiousness.

There is growing agreement among personality psychologists from many different perspectives that, at the broadest level, there are five major dimensions of personality (Digman, 1990; John, 1990; Hogan, 1987; Wiggins & Trapnell, in press). The five factors of Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness (A), and Conscientiousness (C) have been recovered in self-reports and ratings, in studies of adults and children, in a variety of theoretically based questionnaires, and in the analysis of adjectives from several different languages.

These broad factors are defined by more narrow traits (or facets; Costa & McCrae, in press), and Briggs (1989) has recently argued that psychologists should explore these lower-level traits, for two reasons: (1) because they provide a clearer conceptual basis for the five broad factors; and (2) because they themselves mark important individual differences. For example, two individuals with identical extraversion scores may differ strikingly in their profiles on specific facets of E, and these differences may be significant in many contexts. The specific variance associated with individual traits may have predictive utility, as shown by Mershon and Gorsuch (1988).

Conceptually, the nature of the factors can be determined from the individual adjectives (Goldberg, 1990) or homogeneous item clusters (Hogan, 1986) that define them, but no published instrument routinely provides scores on facets of all five factors. The Revised Interpersonal Adjective Scales–Big Five (IASR-B5) of Trapnell and Wiggins (1990) measure eight traits that form the interpersonal circumplex and specify elements of A and E, but provide only global measures of N, O, and C. The NEO Personality Inventory (Costa & McCrae, 1985, 1989a) has facet scales for N, E, and O, but not for A and C. This paper introduces new scales to measure facets of these latter domains.

The consensus on the five-factor model does not extend to the level of facet traits (Briggs, 1989). The body of trait terms in the English language provided a useful guide to broad factors, but many important distinctions that trait psychologists make have not been encoded in lay adjectives (McCrae, 1990), so analyses of adjectives are unlikely to be sufficient for the identification of facets.

*Portions of this paper were presented at the *Annual Meeting of the Society of Multivariate Experimental Psychology*, 2–4 November 1989, Honolulu, HI, and at the *Midwinter Meeting of the Society for Personality Assessment*, 7–9 March 1991, New Orleans, LA.

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At present, it appears that the best basis for specifying facets A and C is an analysis of the psychological literature. Although the facets proposed are not the only possible ones, they should mark an advance over global scales, and research using these new facet scales may lead eventually to improved conceptualizations.

Our approach to the development of A and C facet scales parallels earlier work on N, E, and O (Costa & McCrae, 1978, 1980). We identified six facet scales for each domain, not because each is natually divisible into six parts, but because at least six distinctions were suggested by the literature, and more than six scales would tax the user's ability to learn and remember the facets. For each domain, we sought to identify traits that were familiar through previous theory and measurement, roughly comparable in breadth, and maximally distinct from each other.

CONCEPTUALIZING FACETS OF AGREEABLENESS AND CONSCIENTIOUSNESS

The process of conceptualizing facets involves identifying as many relevant constructs as possible and then grouping them into categories. Items can then be written to tap the proposed facets, and item analyses provide empirical tests of the proposed conceptual distinctions. A conceptual analysis of Agreeableness has been published (Costa, McCrae & Dembroski, 1989); an early analysis of Conscientiousness (as self-control) was offered by McCrae (1976). This section summarizes our current view of the facets and traces their origins in the psychological literature.

Agreeableness

Agreeableness, like Extraversion, is primarily a dimension of interpersonal behavior; but whereas E is chiefly related to the preferred quantity of social stimulation, A represents the characteristic quality of interaction "along a continuum from compassion to antagonism" (Costa & McCrae, 1985, p. 2). This dimension is perhaps most familiar in its role as one of the defining axes of the interpersonal circumplex (McCrae & Costa, 1989), but A is revealed in more than interpersonal behavior. Agreeableness also influences the self-image and helps to shape social attitudes and philosophy of life. We have identified Trust, Straightforwardness, Altruism, Compliance, Modesty, and Tender-Mindedness as facets of A.

Trust can be defined as the tendency to attribute benevolent intent to others; distrust as the suspicion that others are dishonest or dangerous. Trust is a classic personality variable, seen by Erikson (1950) as the foundation of psychosocial development, and by Wrightsman (1974) as one of the major definers of each individual's philosophy of human nature. Trust is also an important element of lay conceptions of personality. When Norman classified 1431 English-language trait descriptive adjectives into 75 categories (Goldberg, 1989), the first category assigned to the Agreeableness factor was called Trust. Low standing on this facet is associated with cynicism.

Straightforwardness implies directness and frankness in dealing with others. This variable is far more important in moral philosophy than it has been in personality psychology, although one version of its opposite pole, Machiavellianism (Geis, 1978), was a popular concept in the 1970s. The concept of Self-monitoring (Snyder, 1974) also involves low Straightforwardness. Wiggins (1979) identified a similar dimension of the Interpersonal Circumplex contrasting Ingenuous with Calculating.

Altruism is selflessness and concern for others, and as a concept it has figured prominently in recent social psychology, but also in the classic personality theory of Adler (1964), who called it 'social interest'. Norman's categories contrast Generosity and Altruism with Greed; Murray's (1938) need for Nurturance is probably also related. The word 'altruism' sometimes suggests conspicuous self-sacrifice; here it is also intended to cover more mundane courtesy and consideration.

Compliance is an interpersonal style that is seen when conflicts arise; compliant individuals defer to others instead of fighting; they are meek and mild. In a positive sense, this trait is seen in a willingness to cooperate that Norman called Agreeableness and Digman and Inouye (1986) called Friendly Compliance. The opposite, aggressive, pole is better known: Anger Expression is a major part of Buss and Durkee's (1957) Hostility Inventory; Quarrelsomeness was one of Wiggins' (1979) IAS variables (although it was omitted from the revision of the IAS); and aggression is a key

concept in social psychology, psychiatry, and even ethology. Vindictiveness, Antagonism, and Aggressiveness are the corresponding Norman categories.

Modesty, or humility, refers to an aspect of the self-concept. Modest people are not preoccupied with themselves; arrogant people have an inflated view of themselves. Murray (1938) identified a need for Abasement, and Wiggins (1979) contrasted Arrogant with Unassuming traits. The clinical concept of Narcissism refers to a pathologically extreme lack of modesty.

Tender-Mindedness refers to the tendency to be guided by feelings, particularly those of sympathy, in making judgments and forming attitudes. The term was originated by William James, and this dimension is also akin to Eysenck's (1954) T dimension in political and social attitudes. The Thinking–Feeling index of the Myers–Briggs Type Indicator (MBTI; Myers & McCaulley, 1985) measures a related construct. Eysenck and Eysenck (1975) have suggested the use of the term 'Tough-minded' to refer to their Psychoticism dimension, and Scale I of the 16PF (Cattell, Eber & Tatsuoka, 1970) is also called Tender-Mindedness, but both these constructs are considerably broader than our conception of Tender-Mindedness.

Conscientiousness

As an aspect of character, Conscientiousness was studied by Hartshorn, May and Maller (1929); as an aspect of ego strength, it was described by Murray and Kluckhohn (1953) using such terms as will power, initiative, and responsibility. Tellegen and Waller (in press) have identified the related dimension of Constraint. We conceptualize C as having both proactive and inhibitive aspects, and once favored the term Direction as the name of the domain, because it implied both movement and focus. The proactive side of Conscientiousness is seen most clearly in the need for achievement and commitment to work; the inhibitive side is seen in moral scrupulousness and cautiousness. The proposed facets of C are Competence, Order, Dutifulness, Achievement Striving, Self-Discipline, and Deliberation.

By Competence we mean the sense that one is capable, sensible, and accomplished. The concept is chiefly known from White's (1959) essay on the topic; a sense of competence is a major component of some versions of self-esteem (e.g. O'Brien & Epstein, 1974). Many lexical studies show that some aspects of rated or self-reported intelligence (e.g. logical, foresighted vs thoughtless, imperceptive) also load on a Conscientiousness factor (McCrae, 1990); we view these as reflections of Competence. We would also hypothesize that locus of control would be related to this facet.

Order, the tendency to keep one's environment tidy and well organized, is familiar from several personality inventories: Orderly is one of the scales of Lorr's (1986) Interpersonal Style Inventory (ISI) in the Self-Control cluster. Order was one of Murray's needs, and one of Norman's categories. Pathological forms of Order are seen in compulsive behavior.

Dutifulness refers to strict adherence to standards of conduct; it is seen in Norman's Reliability category. Freudian concepts of superego strength are also related, and this is probably the facet of C closest to Cattell's G factor. Dutifulness should not be equated with moral development or reasoning (Rest, 1979); it does not concern the origin or sophistication of moral principles, only the extent to which principles or standards are observed.

Digman and Inouye (1986) preferred to call C 'Will to Achieve', and Achievement Striving is one of our facets of C. Need for achievement is perhaps the most widely researched of Murray's needs, and our view of this trait is consistent with the classical definition of Achievement as a striving for excellence. Some versions of the Type A construct emphasize excessive achievement motivation (Rosenman, Brand, Jenkins, Friedmn, Straus & Wurm, 1975), although there is now convincing evidence that high need for Achievement is not a risk factor for coronary disease (Matthews & Haynes, 1986).

We view Self-discipline primarily in terms of persistence, the ability to continue with a task despite boredom or other distractions (compare Lorr's Persistent scale). Individuals low in Self-discipline are prone to procrastination, and they quickly give up when faced with frustration. Self-discipline is one aspect of self-control, but self-control is a broader construct which also includes aspects of Neuroticism. A factor analysis of self-control scales (McCrae & Costa, 1985b) suggested that the inhibition of urges and impulses (to eat, smoke, spend money) is more closely related to N than to C, and Impulsiveness in the NEO-PI is a facet of N. Self-Discipline refers to a more proactive perseverance in tasks that are not immediately appealing, and is an element of C.

Finally, Deliberation means caution, planning, and thoughtfulness. This facet can be contrasted with Buss and Plomin's (1975) Quick Decision Time and with some of the more cognitive conceptions of reflection–impulsivity (Kagan, 1966). Lorr included Deliberate among his ISI Self-Control scales.

SCALE DEVELOPMENT: PILOT STUDIES

First pilot study: A and C facet scales

Based on these conceptualizations, 152 items were written to measure the 12 A and C facets. These items were intended to supplement the 36 A and C items in the current NEO-PI, with equal numbers of positively and negatively keyed items for each proposed facet. We will refer to these *a priori* scales as the Phase I facets. The 188 items were administered to a sample of 93 men, aged 32–91, and 123 women, aged 28–82 (Costa & McCrae, 1989b). The *S*s, who were described by McCrae and Costa (1987), were initially recruited as peer raters for participants in the Baltimore Longitudinal Study of Aging (BLSA; Shock, Greulich, Andres, Arenberg, Costa, Lakatta & Tobin, 1984). In 1986 they provided self-report data on the NEO-PI, the Personality Research Form (Jackson, 1984), and the Buss–Durkee Hostility Inventory; in 1987 they completed the Millon Clinical Multiaxial Inventory (MCMI; Millon, 1983) and the California Psychological Inventory (CPI; Gough, 1987), as well as the Phase I facets. As in the NEO-PI, items were answered on a five-point Likert scale from 'strongly disagree' to 'strongly agree'.

Analyses of these data generally supported the conceptual model of the facets. Joint factor analysis of the Phase I scales and NEO-PI scales showed that 10 of the 12 scales had their highest loading on the appropriate factor. A series of item analyses were then undertaken to select the best eight items for each facet. Items more highly related to unintended factors were eliminated, and item factor analyses were then conducted within A and C item pools separately. These analyses supported the conceptual distinctions among the facets, and led to the development of Phase II scales composed of the original 36 A and C items and 60 of the new trial items.

Estimates of internal consistency for the Phase II scales ranged from 0.64 for Tender-Mindedness to 0.84 for Self-Discipline; Coefficient alpha for the 48-item Agreeableness score formed by summing the Phase II facets was 0.88; for Conscientiousness, it was 0.92. Correlations of the facets with the MCMI Personality Disorder Scales, the PRF Needs, the revised CPI scales, and the Buss–Durkee Hostility Inventory scales showed preliminary evidence of convergent and discriminant validity (Costa & McCrae, 1990; McCrae, Costa & Piedmont, submitted). For example, Trust was negatively related to BDHI Suspicion, Compliance was negatively related to PRF Aggression, and Modesty was negatively related to PRF Exhibition (all $Ps < 0.001$). There were strong correlations between Order and PRF Order ($r = 0.71$), Achievement Striving and PRF Achievement ($r = 0.59$), and Deliberation and PRF Cognitive Structure ($r = 0.43$).

Second pilot study: revisions of N, E, and O facets

The addition of A and C facet scales provided an opportunity to revise the existing N, E, and O facet scales. Since publication in 1985, it has become clear that a few items were misplaced. For example, the item 'Others think of me as being modest and unassuming' is currently scored as (low) Assertiveness; it is now clear that it is better thought of as a Modesty item. A few other items showed low item–total correlations. To refine the N, E, and O facet scales, a second pilot study was conducted using volunteers from the BLSA and their spouses.

In 1990, 222 men aged 29–96, and 172 women aged 23–93 completed a 120-item questionnaire that consisted of the 60 new Phase II A and C facet items, 36 additional A and C trial items, and—of particular concern here—24 trial N, E, and O items. The *S*s had previously completed the NEO-PI in 1986 (Costa & McCrae, 1988); a joint analysis of the items from the two administrations was conducted. A conservative item selection strategy was adopted: to replace a NEO-PI item, the proposed new item had to show better convergent and discriminant validity with NEO-PI scales despite the fact that it was administered 4 yr later. Ten items met this criterion, leading to changes of two items each for the Hostility, Gregariousness, and Assertiveness scales and of one item each for the Activity, Excitement Seeking, and Openness to Feelings and Actions scales. These 10 changes substantially improved the factor structure of the facets.

STUDY 1

Method

Subjects. As part of a study of job performance predictors, 1825 men and women employed by a large national organization were administered the NEO-PI and supplementary items. Of these, 1760 (96%) had complete and valid personality data; however, 221 *S*s did not specify sex, and so were excluded from the analyses. The final sample of 1539 included 543 men and 996 women. Most of the *S*s (71.1% of the men and 68.3% of the women) were white, but a substantial minority were black (16.4% of the men and 22.8% of the women). Half of the women and three-quarters of the men had college degrees; virtually all *S*s were high-school graduates. The men ranged in age from 21 to 63 ($M = 32.3$, SD = 8.8); the women from 21 to 64 ($M = 33.4$, SD = 9.2). This sample is thus considerably younger, had less formal education, and is more racially diverse than the BLSA samples on which the NEO-PI was developed.

Measures and procedure. The NEO Personality Inventory (NEO-PI; Costa & McCrae, 1985, 1989a) is a 181-item questionnaire developed through rational and factor analytic methods to measure the five-factor model of personality. Scales are balanced to control for the effects of acquiescence, and a series of studies have shown that scores are not strongly influenced by socially desirable responding when administered to volunteers (e.g. McCrae & Costa, 1983). Scales show adequate internal consistency and are stable over a 6-year period (Costa & McCrae, 1988). The instrument has been reviewed by Hogan (1989) and Leong and Dollinger (1990). Subjects were also administered the 120-item questionnaire used in the second pilot study which included trial items for revising N, E, and O facet scales and items intended to measure facets of A and C. The two instruments were combined and completed by *S*s during time provided by their employer. Subjects were assured that responses would remain confidential, and that results would have no effect on their job evaluation.

Subjects were also administered the Janis–Field Self-Esteem scale (Robinson & Shaver, 1973), the Rotter (1966) Locus of Control scale, and six scales from the Revised CPI (Gough, 1987): Capacity for Status, Social Presence, Self-Acceptance, Achievement via Conformance, Achievement via Independence, and Work Orientation. These scales were used as criteria to examine validity of the NEO-PIR scales in this sample.

Results and discussion

Items from the Phase II A and C scales were supplemented by 36 new trial A and C items and four items previously assigned to facets of N and E. Factor analyses were conducted separately for A and C items, extracting and rotating six factors in each case. To control for acquiescent responding, an index was created by summing all 300 items in the combined inventories without regard for keying direction; this index was partialled from the item correlation matrix before factoring in all the item analyses reported here. These analyses were generally consistent with the intended structure of the facets: five of the six proposed A facets and five of the six proposed C facets were recovered. (The exceptions were Straightforwardness and Self-Discipline, which were related to several of the obtained factors.) Final, Phase III, item selection was based on (a) factor loadings in this analysis and in subsequent analyses on reduced sets of items; (b) the mandatory inclusion of items used in the short form of the NEO-PI, the NEO Five-Factor Inventory; and (c) the requirement that no more than six of the eight items on any scale be keyed in the same direction. These considerations led to changes of 1–3 items on 10 of the A and C facet scales; no changes were made for Trust or Achievement Striving.

Because the NEO-PI has been extensively validated and the Phase II A and C scales have shown preliminary evidence of validity, the correlations between the original scales and the corresponding revised scales are of interest in establishing the validity of the latter. The revised scales were therefore correlated with the original NEO-PI and Phase II scales. For the seven N, E, and O facet scales with item changes suggested by the second pilot study, these equivalence correlations ranged between 0.93 and 0.95; for the 10 A and C facet scales that were changed, the correlations ranged from 0.78 to 0.97 (median = 0.88). When the original NEO-PI domain scores were correlated with the new domain scores, the equivalence correlations were 1.0, 0.99, 0.99, 0.84, and 0.89 for N, E, O, A, and C, respectively. The very high correlations for the N, E, and O domains reflect the fact

that the great majority of items in the two versions are the same; however, because the original A and C domain scales contain only 18 items whereas the revised scales contain 48 items, the A and C correlations cannot be attributed solely to item overlap.

The Revised NEO-PI (NEO-PIR) consists of 240 items that define 30 eight-item facet scales grouped into five domains. Would an item factor analysis recover these scales? It should be noted that although the present sample was used in the selection of A and C items, it was not used in the selection of N, E, or O items, and thus constitutes a strict cross-validation sample for the latter domains. When five Varimax factors were extracted, they correspond to the hypothesized factors; the correlations of the factor scores with the corresponding domain scale scores were 0.91, 0.89, 0.95, 0.95, and 0.89, respectively, for N, E, O, A, and C.

Item analysis at the facet level is a much more stringent test of the model, because five groups of six correlated factors are hypothesized, each with only eight single-item markers. When 30 Varimax factors were examined from the 240-item matrix, three were broad factors representing N, C, and a combination of E and A items. Even in this analysis, however, 15 of the facet scales were clearly recovered, with correlations between facet scales and factor scores of 0.66–0.90.

Orthogonal Procrustes analysis (Schönemann, 1966) may offer a more reasonable approach to determining the degree of consistency between the hypothesized and observed item structures. In this analysis, the 30 Varimax factors were rotated to a target of 1s, −1s, and 0s, based on the item scoring key. This rotation showed an excellent fit. A total of 206 of the 240 items had their largest loading on the intended factor, including a majority of items from each facet scale. For the 48-item domain scales, 39 N items, 40 E items, 45 O items, 41 A items and 41 C items had their largest loading on the intended factor. The 30 convergent correlations between the factors and corresponding facet scale scores ranged from 0.54 to 0.89, with a median of 0.72; by contrast, the largest of the 870 discriminant correlations was 0.34. It appears that the fine-grained conceptual distinctions embodied in the NEO-PIR facets are consistent with the factor structure of the items.

Coefficient alphas for the domain scales in the full sample were 0.92, 0.89, 0.87, 0.86, and 0.90, respectively, for N, E, O, A, and C. Reliabilities for the facet scales are given in Table 1; they range from 0.56 to 0.81, with a median of 0.71. For eight-item scales, these are reasonable values. The relatively low values for the Tender-Mindedness and Compliance facets of A suggest that particular attention will be needed in the validation of these scales in Study 2.

Table 1 also presents the results of a factor analysis of the 30 facet scales. Five principal components had eigenvalues greater than 1.0 and together accounted for 58% of the variance; a scree test clearly indicated the presence of five factors. After Varimax rotation, all facet scales have their highest loading on the intended factor. Despite the fact that all facets could be distinguished in a factor analysis of the items, they clearly covary at a broader level to form the five factors. There are six large secondary loadings, but all are understandable: for example, the loadings of Activity on C, Altruism on E, and Hostility on A reflect the facts that conscientious people keep busy, that extraverts are friendly and helpful, and that disagreeable people are often angry.

The size and diverse composition of this sample makes it possible to examine the replicability of this factor structure across different groups. Because most research on the NEO-PI has employed samples that are predominantly white, older adults, it is of particular interest to examine the factor structure in young adult (i.e. 21–29 years) and non-white subsamples. Separate factor analyses were conducted for men and women, for younger ($n = 708$) and older ($n = 823$) *S*s, and for white ($n = 1042$) and non-white ($n = 462$) *S*s, and factor congruence coefficients (Wrigley & Neuhaus, 1955) were calculated between each contrasted pair. Of these 15 coefficients, 14 were 0.95 or above; the 15th, for the A factor in whites vs non-whites, was 0.91.

Previous analyses have shown factorial invariance for the N, E, and O facet scales across age and sex groups (e.g. McCrae & Costa, 1983), but this is the first demonstration of the factorial validity of the NEO-PI in a non-white sample. It is perhaps not surprising that the factor structure of the NEO-PIR is so robust: it was developed on the basis of a large body of research which has recovered the five-factor model of personality in several different cultures, languages, and age groups. Factorial invariance in the NEO-PI is a necessary, though not sufficient, criterion for judging the success with which the instrument reflects the model.

Some evidence of validity of the NEO-PIR scales is given in Table 2, which shows correlations with other scales administered to this sample. Self-esteem is strongly, and predictably, related to

Table 1. Internal consistency and factor loadings for NEO-PIR facets

NEO-PIR scale	Coefficient alpha	Factor N	E	O	A	C
N1: Anxiety	78	**82**	−03	−02	01	−08
N2: Hostility	75	**68**	−12	00	**−46**	−07
N3: Depression	81	**80**	−17	00	−01	−25
N4: Self-Consciousness	68	**72**	−24	−07	08	−19
N5: Impulsiveness	70	**55**	24	10	−16	−35
N6: Vulnerability	77	**70**	−16	−14	−03	**−40**
E1: Warmth	73	−08	**74**	12	30	16
E2: Gregariousness	72	−16	**72**	−03	01	01
E3: Assertiveness	77	−31	**48**	13	−33	**40**
E4: Activity	63	−03	**51**	17	−19	**48**
E5: Excitement Seeking	65	01	**57**	24	−34	−08
E6: Positive Emotions	73	−07	**73**	24	16	11
O1: Fantasy	76	21	16	**60**	−14	−30
O2: Aesthetics	76	11	03	**76**	12	11
O3: Feelings	66	**41**	37	**52**	00	13
O4: Actions	58	−23	21	**60**	03	03
O5: Ideas	80	−18	−04	**76**	−08	17
O6: Values	67	−06	10	**54**	−03	−14
A1: Trust	79	−30	37	12	**49**	05
A2: Straightforwardness	71	−02	−08	−08	**70**	19
A3: Altruism	75	−05	**48**	00	**59**	27
A4: Compliance	59	−19	00	−06	**74**	−01
A5: Modesty	67	14	−21	−05	**59**	−12
A6: Tender-Mindedness	56	01	21	11	**61**	09
C1: Competence	67	−38	21	15	09	**62**
C2: Order	66	02	07	−18	01	**69**
C3: Dutifulness	62	−21	01	−02	25	**69**
C4: Achievement Striving	67	−12	18	15	−09	**76**
C5: Self-Discipline	75	−34	14	00	12	**74**
C6: Deliberation	71	−33	−20	−11	22	**58**

$n = 1539$. These are Varimax-rotated principal components. Decimal points are omitted. Loadings over ±0.40 are given in boldface.

low N, high E, and high C (compare McCrae & Costa, 1988). Among the A and C facets, it is most highly correlated (as hypothesized) with Competence, $r = 0.59$, and with Self-Discipline, $r = 0.50$, and Achievement Striving, $r = 0.41$. External Locus of Control scores are related to N and low C. All six of the C facet scales are significantly negatively related to Locus of Control, but, as hypothesized, the association is strongest with the Competence facet of C, $r = -0.29$.

Correlations with the CPI scales generally replicate findings reported elsewhere (McCrae, Costa & Piedmont, submitted). As in that study, Capacity for Status, Social Presence, and Self-Acceptance are chiefly related to E and O; Achievement via Conformance to low N and high C; and Achievement via Independence to O. Work Orientation, which was not examined in the earlier study, is related chiefly to low N and high A and C in the present sample. Of these six scales, Achievement via Conformance and Work Orientation are most relevant to the evaluation of A and C facets. Achievement via Conformance is strongly and appropriately related to Competence, Dutifulness, Achievement, and Self-Discipline, $rs = 0.40$–0.49; Work Orientation is related chiefly to the Trust facet of A, $r = 0.41$, and the Competence facet of C, $r = 0.42$.

Table 2. Correlations of NEO-PIR domain scales with criterion scales

Criterion scale	NEO-PIR domain scale N	E	O	A	C
Self-Esteem	−0.69***	0.49***	0.16***	0.12***	0.51***
Locus of Control	0.35***	−0.12***	−0.05*	−0.12***	−0.25***
CPI scales					
Capacity for Status	−0.38***	0.43***	0.48***	0.04	0.23***
Social Presence	−0.28***	0.52***	0.41***	−0.15***	0.09***
Self-Acceptance	−0.29***	0.52***	0.39***	−0.12***	0.21***
Achievement via Conformance	−0.47***	0.22***	0.07**	0.30***	0.55***
Achievement via Independence	−0.30***	0.15***	0.42***	0.12***	0.14***
Work Orientation	−0.56***	0.14***	0.01	0.36***	0.39***

$n = 1491$–1541. *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

STUDY 2

It is necessary to have external criteria to evaluate the convergent and discriminant validity of the new A and C facet scales, and the archives of the BLSA offer a number of relevant and useful criteria, including several standard personality questionnaires. Study 2 examines the relations of the new facet scales to these instruments. In addition, we consider correlations among the five domain scales.

Method

Subjects. The 394 BLSA participants and spouses from the second pilot study for the selection of new N, E, and O items served as *S*s in this study. It should be noted that these *S*s were not involved in the selection of A and C facet items. BLSA participants are generally healthy, predominantly white, well-educated, community-dwelling adults (Shock *et al.*, 1984). All are volunteers who have agreed to periodic psychological and biomedical testing; over the past 30 yr they have provided data on a wide variety of instruments.

Measures. Participants completed the NEO-PI in 1986 and the additional 120 items administered in Study 1 in 1990; item responses were pooled to score the A and C facets. Domain scales for A and C are calculated by summing the facet scales for each. Between 1960 and 1978 men in the BLSA completed the Guilford–Zimmerman Temperament Survey (GZTS; Guilford, Zimmerman & Guilford, 1976) while visiting the Gerontology Research Center. Between 1979 and 1987 both male and female participants completed a variety of questionnaires at home and returned them by mail. These included the Eysenck Personality Inventory (EPI; Eysenck & Eysenck, 1964) and a new scale developed by the Eysencks to measure Psychoticism (see McCrae & Costa, 1985a); the Myers–Briggs Type Indicator (MBTI; Myers & McCaulley, 1985); the Adjective Check List (Gough & Heilbrun, 1983), from which the 15 Murray need scales were scored; the Sensation Seeking Scales V (SSS-V; Zuckerman, 1979); the Revised Interpersonal Adjective Checklist (Wiggins, Trapnell & Phillips, 1988); and the Buss–Durkee Hostility Inventory (BDHI; Buss & Durkee, 1957).

Results and discussion

Tables 3 and 4 present correlations between Agreeableness and Conscientiousness domain and facet scales and the criterion scales. Only criterion scales with at least one correlation of 0.30 or greater in absolute magnitude are reported in the tables. Among the scales that showed no correlation this large with any of the A or C scales were EPI Neuroticism, GZTS Emotional Stability, and GZTS Ojectivity (all measures of N); EPI E, MBTI Introversion–Extraversion, and GZTS Sociability (measures of E); and MBTI Sensation–Intuition and SSS-V Experience Seeking (measures of O). These findings support the discriminant validity of the A and C scales with respect to the other major factors.

The first two columns in Table 3 compare correlations for the original 18-item NEO-PI A domain scale and the revised 48-item A scale. The correlations are very similar, supporting the view that the new scale retains the validity of the older scale. Both columns show clear evidence of convergent validity of the A domain scales, the largest correlates being with ACL needs for Nurturance and Deference, IAS-R Unassuming–Ingenuous vs Arrogant–Calculating scales, and low BDHI Assault and Verbal Hostility.

In general, the revised scale shows larger correlations than the original (mean absolute r values using z transformation are 0.38 and 0.35), but these modest improvements could not themselves justify the increased length of the scale. The advantage of the NEO-PIR is the availability of facet scales that measure distinct aspects of the broader domain. The remaining columns of Table 3 give evidence of the validity—particularly the discriminant validity—of these facet scales. Individuals scoring high in Trust are high in GZTS Personal Relations and low in Psychoticism and especially BDHI Suspicion. High Straightforwardness scores are particularly associated with the Unassuming–Ingenuous scale of the IAS-R, whereas low scores are associated with the Arrogant–Calculating scale and BDHI Indirect Hostility. Altruism is related to ACL Nurturance and the IAS-R Warm–Agreeable scale; Compliance is positively related to GZTS Friendliness and ACL Deference, and negatively related to ACL Autonomy and Aggression and BDHI Assault and Verbal Hostility. Individuals scoring high in Modesty are high in the need for Abasement and low

Table 3. Selected correlations of NEO-PIR Agreeableness scales with criterion scales

	A domain		A facet					
Criterion scale	Original	Revised	A1	A2	A3	A4	A5	A6
Psychoticism	−33	−33	−32	−25	−31	−17	−13	−18
MBTI Thinking–Feeling	35	38	25	12	30	23	23	39
ACL								
Intraception	42	41	34	27	38	37	10[a]	18
Nurturance	51	55	39	29	51	45	23	34
Affiliation	36	39	35	17	40	36	12	19
Exhibition	−22	−26	−01[a]	−27	−04[a]	−31	−32	02[a]
Autonomy	−49	−49	−25	−29	−33	−50	−31	−21
Aggression	−40	−47	−20	−35	−25	−52	−32	−14
Abasement	24	27	−01[a]	22	08[a]	28	32	12
Deference	42	47	19	32	27	47	36	17
GZTS								
Ascendance	−06[a]	−10[a]	15[a]	−21	18	−30	−17[a]	07[a]
Friendliness	26	36	13[a]	31	13[a]	51	25	06[a]
Thoughtfulness	21	29	19	10[a]	24	17	14	33
Personal Relations	22	20	39	21	05[a]	11[a]	−01[a]	07[a]
SSS-V								
Disinhibition	−23	−37	−17	−37	−22	−24	−32	−10[a]
Boredom Susceptibility	−28	−32	−12[a]	−34	−19	−27	−17	−13
IAS-R								
Arrogant–Calculating	−50	−58	−26	−54	−38	−45	−37	−24
Cold-hearted	−55	−56	−37	−36	−58	−28	−23	−44
Aloof–Introverted	−33	−32	−26	−16	−48	−16	04[a]	−34
Unassuming–Ingenuous	41	49	23	48	23	39	35	18
Warm–Agreeable	48	47	29	24	60	19	20	43
Gregarious–Extraverted	26	23	31	04[a]	42	06[a]	−08[a]	29
BDHI								
Assault	−37	−46	−21	−35	−21	−47	−31	−22
Indirect Hostility	−29	−37	−21	−32	−27	−29	−21	−14
Irritability	−37	−37	−38	−24	−28	−37	−05[a]	−17
Resentment	−25	−20	−36	−12	−21	−11	03[a]	−08[a]
Suspicion	−36	−25	−46	−08[a]	−27	−17	07[a]	−13
Verbal Hostility	−46	−49	−15	−34	−26	−63	−32	−14

For GZTS, $n = 126$–135 men. For all other scales, $n = 215$–377 men and women. Except as noted, all correlations are significant at $P < 0.05$. Decimal points are omitted. A1, Trust; A2, Straightforwardness; A3, Altruism; A4, Compliance; A5, Modesty; A6, Tender-Mindedness.

[a]Not significant.

in the need for Exhibition; IAS-R correlations suggest that they are unassuming rather than arrogant. Finally, Tender-Mindedness shows a distinctively large correlation with the MBTI Thinking–Feeling scale, suggesting that high scorers are governed more by their feelings than by cold logic. The cold-heartedness of low scorers is seen in the IAS-R correlates. The pattern of correlations of all the scales support their convergent and discriminant validity; this is particularly noteworthy for Compliance and Tender-Mindedness, which have relatively low internal consistencies.

The first two columns of Table 4 provide evidence on the validity of the original and revised C domain scales. Conceptually, the most relevant criteria in the table are ACL needs for Achievement, Order, and Endurance; they are also the strongest empirical correlates. Across all criteria, the revised scale shows stronger correlations than the original (mean absolute $r = 0.36$ and 0.31). Correlations of the criterion scales with the C facets show that Competence is associated with IAS-R Assured–Dominant and ACL needs for Achievement and (low) Succorance: competent people are confident, accomplished, and able to take care of themselves. NEO-PIR Order is most strongly related to ACL Order; it is also strongly related to the MBTI Judging–Perceiving scale, which measures preference for structured vs spontaneous decision-making. Dutifulness is related to ACL Order and Endurance; it also shows a distinctive negative correlation with SSS-V Disinhibition, which is consistent with the view that this facet measures in part the restraining influence of conscience. Achievement Striving is most highly related to ACL Achievement; it is also related to GZTS General Activity. Self-Discipline is the best predictor of ACL Endurance among the facet scales, and Deliberation is appropriately related to MBTI Judging–Perceiving, (low) ACL Change, and GZTS Restraint.

The many substantial correlations between facets of C and IAS-R scales are somewhat surprising, because the interpersonal circumplex which the IAS-R measures is usually conceptualized

Table 4. Selected correlations of NEO-PIR Conscientiousness scales with criterion scales

	C domain		C facet					
Criterion scale	Original	Revised	C1	C2	C3	C4	C5	C6
Psychoticism	−27	−33	−23	−20	−30	−14	−30	−28
MBTI Judging–Perceiving	−38	−41	−18	−44	−34	−24	−23	−39
ACL								
Achievement	51	58	48	32	34	58	55	23
Dominance	31	39	37	16	21	43	39	09[a]
Endurance	58	65	43	44	48	48	54	44
Order	55	61	39	48	46	36	47	50
Intraception	30	34	29	09[a]	35	18	28	33
Affiliation	22	29	28	06[a]	26	12	32	20
Change	−14	−17	−02[a]	−20	−18	02[a]	−07[a]	−30
Succorance	−32	−38	−40	−15	−30	−28	−35	−19
Abasement	−21	−28	−34	−12	−13	−28	−28	−06[a]
GZTS								
General Activity	27	29	29	−02[a]	25	47	33	−19
Restraint	26	35	15[a]	09[a]	31	28	23	35
Ascendance	21	22	26	03[a]	15[a]	35	19	−08[a]
SSS-V								
Disinhibition	−22	−24	−11[a]	−02[a]	−36	−09[a]	−19	−29
Boredom Susceptibility	−16	−20	−07[a]	−12[a]	−22	−03[a]	−15	−31
IAS-R								
Assured–Dominant	35	41	42	16	25	51	38	04[a]
Cold-hearted	−32	−31	−28	−14	−36	−19	−27	−13
Aloof–Introverted	−35	−37	−34	−16	−32	−32	−37	−11[a]
Unassured–Submissive	−26	−31	−31	−11[a]	−18	−41	−29	−05[a]
Warm–Agreeable	34	31	26	14	33	26	26	12[a]
Gregarious–Extraverted	26	28	27	11[a]	17	34	37	−06[a]
BDHI								
Indirect Hostility	−29	−32	−12	−16	−34	−18	−31	−26
Irritability	−23	−36	−33	−19	−29	−11	−31	−32

For GZTS, $n = 126$–135 men. For all other scales, $n = 215$–377 men and women. Except as noted, all correlations are significant at $P < 0.05$. Decimal points are omitted. C1, Competence; C2, Order; C3, Dutifulness; C4, Achievement Striving; C5, Self-Discipline; C6, Deliberation.

[a]Not significant.

in terms of the two dimensions of E and A (McCrae & Costa, 1989). However, an earlier version of the instrument (Wiggins, 1979) contrasted Ambitious–Dominant with Submissive–Lazy, and the correlations with the Achievement Striving facet scale suggest that elements of ambition vs laziness remain in the revised Assured–Dominant and Unassured–Submissive scales, as seen in such adjectives as firm and persistent. These associations are not artifactual; instead, they demonstrate that traits in the domain of Conscientiousness have interpersonal implications. For example, individuals who are highly competent and driven to succeed are more likely to be the leaders of groups.

Finally, intercorrelations among the domain scales themselves were considered; these are presented in Table 5. As in previous research (Costa & McCrae, 1989a), there was a moderately large correlation between E and O; there was also a substantial negative correlation between N and C. None of the other cross-domain correlations exceeded 0.25 in absolute magnitude. It should be noted in particular that the correlation between A and C is only 0.13; it is thus unlikely that these two domains represent different aspects of a single broader factor such as Psychoticism (McCrae & Costa, 1985a).

GENERAL DISCUSSION

Although the need for scales measuring specific aspects of all five broad personality factors or domains has been recognized for some time, no published instrument has so far provided such

Table 5. Intercorrelations of NEO-PIR domain scales

NEO-PIR domain	N	E	O	A	C
Neuroticism	1.00	−0.21***	0.05	−0.25***	−0.49***
Extraversion		1.00	0.43***	−0.07	0.22***
Openness			1.00	−0.06	−0.04
Agreeableness				1.00	0.13*
Conscientiousness					1.00

$n = 394$. *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

scales. The Revised NEO Personality Inventory (NEO-PIR) is intended to correct this problem by offering six facet scales to measure each of the five domains. An analysis of the personality literature was used to identify specific traits that appeared to be theoretically important, and scales were created to operationalize these constructs. Item factor analyses in a large and diverse sample suggested that the scales empirically reproduce the distinctions embodied in the facets, and factor analyses of the scales clearly recovered the five-factor model itself. Studies of convergent and discriminant validity with other self-report questionnaire scales in a second sample provided supportive evidence for the new A and C facets.

Previous studies of the NEO-PI have shown convergence across spouse and peer observers for all five domains and for the facets of E, N, and O (e.g. Costa & McCrae, 1988). Future studies should examine the cross-observer validity of the new A and C facets. In addition, studies of these new facets in clinical samples would be especially valuable, both as part of the process of generalizing validity across populations and as part of the continuing exploration of the utility of the five-factor model in clinical psychology (e.g. Miller, in press). The analyses presented here provide encouragment for such studies.

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