Structure of Act-Report Data: Is the Five-Factor Model of Personality Recaptured?

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We examined the correspondence between the structure of act-report data and 5-factor models emerging from trait-rating data. Twenty categories were selected as markers for the 5-factor model and retrospective act reports were constructed for the target categories. One hundred eighteen men and women comprising 59 dating couples completed self-based and observer-based act reports. Several factor analyses tested different assumptions. Retaining total act performance (TAP) produced a blend of the traditional 5 factors. Removing TAP closely reproduced the 5-factor model in both principal-components and procrustes analyses. Correlations between the derived act factors and trait ratings from 6 data sources support a reinterpretation of the traditional trait labels. Discussion focuses on the implications of different assumptions on the formulation of a basic model of personality structure.

Identifying a basic set of individual differences has been a central concern of personality psychology for decades (Cattell, 1946; Eysenck, 1947; Fiske, 1949; Goldberg, 1972, 1981; Hogan, 1983; John, Goldberg, & Angleitner, 1984; McCrae & Costa, 1985b; Norman, 1963; Wiggins, 1979). There are important advantages to discovering a common taxonomic structure of personality: Such a discovery could offer a framework for integrating diverse research programs, offer a sound basis for selecting important variables for inclusion in research programs, alert investigators to gaps in current coverage, and provide a foundation for cumulative and integrated advances.

A consensus appears to be forming on precisely such a structure. Different investigations, most based on trait-rating data, have been converging on a five-factor model of personality structure (Digman & Inouye, 1986; Digman & Takemoto-Chock, 1981; Fiske, 1949; Goldberg, 1981, 1982; Hogan, 1983; McCrae & Costa, 1985b, 1987; Norman, 1963; Tupes & Christal, 1961). Although there is some disagreement about labels and precise meanings, these five factors have been named Surgency, Agreeableness, Conscientiousness (Will to Achieve), Emotional Stability, and Culture (Intellectance, Openness).

If a structure of personality is to be comprehensive and generalizable, it should emerge from, and be anchored in, data bases originating from a variety of sources and methodologies. Structures unique to particular methods or data sources may be re-

Correspondence concerning this article should be addressed to David M. Buss, Department of Psychology, University of Michigan, 580 Union Drive, Ann Arbor, Michigan 48109-1346. vealing; however, they do not provide a sound basis for organizing and integrating the field of personality psychology.

With several exceptions, the five-factor models to which we refer have emerged from factor analyses of trait-descriptive adjectives (see John, Angleitner, & Ostendorf, 1988, for a historical review of the topic). These adjectives are typically cast in the form of a series of bipolar rating scales such as dominantsubmissive, timid-bold, and intelligent-stupid. Although observer judgments have been the primary data source, the five factors also emerge from factor analyses of self-report ratings (McCrae & Costa, 1985b, 1987).

McCrae, Costa, and Busch (1986) factor-analyzed the California Q-Sort as an alternative data base from which to derive a dimensional model. When an eight-factor solution was examined in an attempt to replicate Lorr (1978), five factors corresponded closely to those from the five-factor model. Three additional factors were also found: Psychological Mindedness, Attractive-Narcissistic, and a factor resembling Lorr's (1978) Managerial vs. Self-Effacing dimension. The first and third of these additional factors appear not to be replicable (McCrae et al., 1986). The Attractive-Narcissistic factor, although replicable, was judged to be outside the realm of what is typically considered to be personality.

Inventory items have also provided a data base for five-factor models. Four of the five factors were found in an analysis of dichotomous (true-false) formatted items (Norman, 1969). The NEO Personality Inventory (NEO-PI; Costa & McCrae, 1985) also yielded a five-factor structure using 5-point Likert scale items (*strongly agree* to *strongly disagree*). It should be noted that the NEO-PI was specifically developed to assess the five-factor model. Hence, it would not be expected to yield factors outside of the five-factor model.

Joint factor analyses of a variety of personality inventories have found further support for the five-factor model. A comparison of the NEO-PI, the Eysenck Personality Inventory (EPI; Eysenck & Eysenck, 1975), and Goldberg's (1983) 40 bipolar adjective scales yielded a five-factor solution (McCrae & Costa, 1985a). Because the goal of this study was to relate Eysenck's

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model of personality to the five-factor model, dimensions outside of these domains would not be expected.

A set of 46 scales selected from eight personality measures designed to assess biological bases of behavior produced a fivefactor structure (Zuckerman, Kuhlman, & Camac, 1988). These factors reflect content similar to the traditional five-factor model, including Sociability (Surgency), Aggressive Sensation Seeking (negative Agreeableness), Activity (Conscientiousness, Will to Achieve), Emotionality (negative Emotional Stability), and Impulsive, Unsocialized Sensation Seeking (Openness to Experience).

Joint factor analyses of the 16 Personality Factor Questionnaire scales (Cattell, Eber, & Tatsuoka, 1970), the Comrey Personality Scales (Comrey, 1970), and the EPI (Eysenck & Eysenck, 1964) produced a seven-factor solution (Noller, Law, & Comrey, 1987). With the exception of the Culture dimension, the five-factor model was recovered in addition to factors of Masculinity–Femininity and two factors related to sociability and response bias.

Factor analyses using German subjects have shown structures similar to the five-factor model (Amelang & Borkenau, 1982; John, Goldberg, & Angleitner, 1984). Analyses using Japanese subjects have also yielded the five-factor structure (Bond, Nakazato, & Shiraishi, 1975). These analyses provide interesting cross-cultural replications of the five-factor model. Further research within different cultures and using different data bases is clearly needed to identify the generality of the five-factor model.

One form of data that has not yet been examined consists of reports of act performance by self and by observers who are in a position to witness and report on such acts.¹ The present study was designed to identify the structure of act-report data and to examine its correspondence with factor models emerging from trait-rating data. Trait ratings were obtained from six data sources to identify empirical links as well as structural correspondences. These data bases differ from previous ones in that act reports are based on specific behaviors and their frequency of occurrence, rather than on item or trait adjective endorsement. Some personality scales do contain items that refer to specific behavioral events. For example, the California Psychological Inventory (CPI) Socialization scale (Gough, 1987) contains a few items such as "I have been in trouble with the law" and "I have used alcohol excessively" that refer to events in a person's past. However, a perusal of major personality inventories revealed that such items are rare and do not delineate a clear time frame during which the events occurred (Buss, 1980; Werner & Pervin, 1986; see also Angleitner, John, & Lohr, 1986).

Only one previous factor-analytic study has been conducted using act-report data (Buss & Craik, 1984). That analysis was limited, however, in that the acts were drawn solely from a twodimensional structure of interpersonal behaviors, the Wiggins (1979) circumplex model. Thus, acts subsumed by dispositions outside of this two-dimensional model were not represented.

In contrast, the present study started with trait categories drawn from the five-factor model generated by Goldberg (1983). We selected four categories to represent each factor, two for each end of each dimension. For Surgency, we chose the categories of dominance, extraversion, submissiveness, and introversion. For Agreeableness, we chose the categories of agreeable, warm, quarrelsome, and cold. For Conscientiousness, we selected the categories of conscientious, responsible, unconscientious, and irresponsible. For Emotional Stability, we selected the categories of secure, emotionally stable, insecure, and emotionally unstable. For Culture-Intellectance, we chose the categories of cultured, intelligent, uncultured, and stupid. We included two additional act categories—calculating and ingenuous (Wiggins, 1979)—to test the hypothesis that these categories are not represented well by existing five-factor models of personality (Buss & Craik, 1985). These categories are "blends" of the 1st two factors in five-factor models. Buss and Craik (1985) argued, however, that these categories may contain acts not easily subsumed by these factors.

In sum, the purposes of this study were (a) to identify the structure of act-report data using self-reported act performance and observer-reported act performance, (b) to compare this structure with five-factor models emerging from trait-rating data, (c) to test the hypothesis that the trait categories of calculating and ingenuous are not well subsumed by the five-factor model, and (d) to identify empirically the links between traitrating factors and retrospective act-report factors.

Preliminary Study: Act Nominations

The goal of the preliminary study was to obtain a sample of acts for each of the 22 selected categories that could be used to construct act reports. These act reports would be completed by subjects in the main study in both self-report and partner-report forms. Toward this end, we adapted an act nomination procedure from Buss and Craik (1980).

Subjects

Subjects were 140 undergraduates consisting of 14 groups of 10 people each. Subjects nominated acts from only a single category. Categories were drawn from the following: warm, cold, conscientious, responsible, unconscientious, irresponsible, emotionally stable, emotionally unstable, secure, insecure, cultured, uncultured, intelligent, and stupid.

Procedure

Subjects received a sheet with the following instructional set:

Think of the three most WARM [cold, emotionally stable, insecure, etc.] individuals you know. With these individuals in mind, write down five acts or behaviors they have performed (or might perform) that reflect or exemplify their WARMTH [aggressiveness, emotional stability, etc.].

Selection

Acts were selected for each category in one of two ways. Five members of the research team independently selected the 15 acts they thought best represented each category. The 15 acts selected most frequently were retained for the main study.

These were supplemented by acts previously used from the categories of dominance, submissiveness, extraversion, intro-

¹ It should be noted that this study, like nearly all act frequency studies carried out over the past 7 years (e.g., Buss & Craik, 1984, 1985), use two separate data sources to assess act performance, thus circumventing the limitations of self-report noted by Block (1989).

version, agreeable, quarrelsome, calculating, and ingenuous (Buss & Craik, 1984). The acts from these 6 categories were drawn from the top quartile in prototypicality of a set of 100 acts in each category. Thus, 330 acts (15 acts from each of the 22 targeted categories) were retained for the main study. Sample acts from each category are shown in the appendix.

Main Study: Reports of Act Performance

Method

Subjects

Subjects for the main study were 118 undergraduates comprising 59 dating couples. Couples were recruited through ongoing classes, fliers placed in dormitories, and announcements in the student newspaper. A minimum 6-month period of dating the same person was required for participation in the study. We imposed this restriction to ensure a reasonably prolonged period of contact between the target subjects.

Materials

Along with a larger battery of tests and assessment measures, we used the following instruments for this study.

Act reports completed by subjects. Two self-reported act reports, one containing 150 acts and the other containing 180 acts, were completed by the subjects. Acts from each of the 22 categories were intermingled and were not identified by the category from which they were drawn. The following instructional set was used:

The following pages contain 150 acts beginning with act (1) to act (150). For each act, please indicate how often you have performed it (if at all) within the last three months, by circling the appropriate response to the right of the act. NA = not applicable, one = once within the last three months, two = twice within the last three months, 1/mo = once a month, 2/mo = twice a month, 1/wk = once a week, few x/wk = few times a week, daily + = almost daily, or more

Act reports completed by partners. A week following completion of the self-reported act instruments, subjects completed a structurally analogous act report about their partner's behavior. Partners were physically separated during the testing session to preserve the independence of their reports.

Trait ratings by six data sources. Trait ratings were made on each target subject by six sources: self, partner, friend, mother, father, and two independent interviewers. Names and addresses of close friends, mothers, and fathers were obtained from each subject. Signed permission was obtained from subjects to contact family and friends to request participation in this research project. Separate packets of research instruments were mailed to the close friend, mother, and father of each subject. Stamped, self-addressed envelopes were provided for them to return the instruments to the investigators. Traits representing the five-factor model were assessed through 40 bipolar adjective pairs representing the categories of Surgency, Agreeableness, Conscientiousness, Emotional Stability, and Culture. These adjective pairs were drawn from the highest loading pairs of adjectives from factor analyses conducted by Goldberg (1983). Each member of an adjective pair anchored one side of the 7-point rating scale.

The informational basis for trait ratings by partners, friends, mothers, and fathers stemmed from prior knowledge of and interaction with the target subjects. In addition, each couple was interviewed by a pair of interviewers, one man and one woman, drawn from a rotating team of eight interviewers. Questions posed during the interview covered how the partners met, what initially attracted them to each other, what their similarities and differences were, and what the probability that they would be together in a year was. Directly following the interview, each interviewer independently rated each subject on the 40 bipolar trait pairs. Judgments from the two interviewers were summed to achieve more reliable indexes. The composite reliabilities for the five scales were Surgency (.75), Agreeableness (.76), Conscientiousness (.76), Emotional Stability (.73), and Culture (.74).

Interpersonal Adjective Scales (IAS). The IAS was developed by Wiggins (1979) to operationalize a circumplex model of personality. We used the 128-item version of the IAS, which yields scores for 16 variables. The major orthogonal axes of the circumplex model are dominance-submissiveness and quarrelsomeness-agreeableness. The 128 adjectives are endorsed on a 9-point scale. Eight items are then composited for each of the 16 scales.

Eysenck Personality Questionnaire (EPQ). The EPQ, developed by Eysenck and Eysenck (1975), is a 90-item instrument that is scored for three substantive scales and one validity scale. Scores are obtained for Extraversion, Neuroticism, and Psychoticism. A "Lie" scale is also scored to reflect socially desirable responding, although substantive personality content appears also to be associated with Lie scale scores (Mc-Crae & Costa, 1983).

California Psychological Inventory. Items from six scales were extracted from the 480-item CPI (Gough, 1957/1964) and administered to subjects on a separate form. The six scales were selected to correspond to the key variables on the five-factor model as follows: Dominance (Surgency), Social Presence (Surgency), Responsibility (Conscientiousness), Socialization (Conscientiousness), Self-Control (Conscientiousness), Intellectual Efficiency (Culture-Intellectance), and Well Being (Emotional Stability).

California Self-Evaluation Scales. These scales were developed by Phinney and Gough (in press) to assess three domains of self-esteem (physical, social, and achievement abilities) and a global index of the degree to which respondents positively evaluate themselves (i.e., general self-esteem). Two forms were administered, a self-report form (CSES) and a partner-report form (COES).

Procedure

Subjects completed most self-report instruments, including personality scales and act reports, at home in their spare time. Subsequently, the couples were scheduled for testing sessions. At the testing sessions, couples were separated to preserve the independence of their ratings. They completed the partner act report and other observer-based reports about their partners. Toward the end of the testing sessions, couples were interviewed together in a separate interview room by the two interviewers.

Results

Construction of Act Composites

We created 22 act composites within each data source: one for each of the 22 target variables. Each act composite score was based on the sum of the acts in each category divided by the number of acts available (typically 15). The distribution of scores for both self- and partner-act composites approximated normal for 21 of the act composites. The cold act composite, however, was negatively skewed for both data sources.

Reliability of Act Composites

We calculated coefficient alpha (Cronbach, 1951) for each composite (see Table 1). For the self-report data source, the reliability coefficients ranged from .67 to .86, with a mean of .78; and for partner-report act composites, from .62 to .86, with a mean of .79. The act composites thus have reasonable internal

	Seli	-report	Partn	er report
Act composite	Coefficient alpha	Mean interact correlation	Coefficient alpha	Mean interact correlation
Dominant	.85	.29	.86	.30
Submissive	.78	.22	.83	.28
Extraverted	.84	.25	.79	.23
Introverted	.76	.17	.79	.18
Agreeable	.75	.21	.76	.18
Ouarrelsome	.82	.24	.82	.29
Warm	.73	.20	.76	.19
Colđ	.81	.21	.78	.27
Conscientious	.71	.16	.73	.15
Unconscientious	.73	.19	.83	.25
Responsible	.71	.16	.62	.12
Irresponsible	.75	.21	.82	.18
Emotionally stable	.83	.28	.86	.29
Emotionally unstable	.86	.27	.84	.25
Secure	.85	.24	.81	.20
Insecure	.85	.23	.81	.24
Cultured	.69	.16	.73	.15
Uncultured	.84	.23	.81	.24
Intelligent	.79	.20	.80	.21
Stupid	.75	.22	.85	.24
Ingenuous	.67	.13	.68	.15
Calculating	.81	.30	.86	.30
М	.78	.22	.79	.22

 Table 1

 Cronbach's Coefficient Alpha Reliabilities and Mean Interact Correlations

 for Self and Partner Act Composites

consistency. The mean interact correlations range from .13 (ingenuous) to .29 (dominant) for the self-report and .12 (responsible) to .30 (dominant) for the partner report.

Correlations Among Act Composites

The correlations among the act composites are shown in Table 2. The Self \times Partner correlations for the 22 act composites are shown in the diagonal. These Self \times Observer correlations range from a high of .64 (Emotional Instability) to a low of .14 (Secure), with a mean of .43. Thus, there exists moderate agreement between the two data sources, although there is variability in the degree of agreement depending on the particular act composite.

The correlations among the act composites within each data source are also shown in Table 2. In general, the act composites are positively correlated, as has been found earlier in act-report data (Buss & Craik, 1983). The positive manifold in these matrices is likely to be due to some combination of a response bias (e.g., individual differences in threshold for endorsing acts) and a substantive general activity level such that some individuals actually perform more acts in all categories. General activity level can be operationalized by summing all the acts performed across all categories.

On the assumption that the endorsement thresholds for the two data sources are independent, one can infer that the correlation between data sources based on sums of all 330 acts represents the degree to which the positive manifold represents a general activity level. This correlation is .41 (p < .001). The mean correlation among composites within data sources is .48 for self-report and .38 for observer report. This suggests that much of the positive manifold can be interpreted in terms of total act performance (TAP).

Because shared variance among act composites due to either response sets or TAP can affect the resultant factor solution, we conducted a series of analyses that controlled for these variables. These analyses are presented in three parts. First, factor analyses of the untransformed composites are presented, then results controlling for the potential operation of response sets, and last, a solution controlling for both response sets and TAP. This sequential analysis permits an examination of the effect of each of these variables on the factor solution.

Factor Analyses of Untransformed Act Composites

A principal-components analysis was conducted separately for both self and partner act composites. Both scree tests (Cattell, 1966) and the "eigenvalue greater than one" rule suggested a four-factor solution for each data source. Four factors explained 69% of the total variance for the self-report data and 72% of the total variance for the partner-report data. To retain comparability with five-factor models, however, five factors were rotated, which accounted for 73% and 76% of the total variance for self and partner, respectively.

Table 2		
Correlations	Between Act	Composites

	Act composite	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1.	Responsible	35	79	66	66	56	59	47	37	29	41	25	26	15	20	24	31	51	26	30	40	31	42
2.	Conscientious	80	45	74	69	63	65	51	44	32	48	27	36	25	26	25	34	51	35	28	51	46	39
3.	Emotionally stable	51	52	28	73	58	67	55	43	36	53	43	37	37	34	38	45	63	40	48	54	47	45
4.	Secure	55	54	79	14	64	76	63	44	23	53	34	40	27	26	36	38	59	38	37	56	53	49
5.	Intelligent	48	48	52	66	25	67	48	46	36	49	36	36	23	23	34	38	58	39	34	53	52	59
6.	Agreeable	49	48	55	70	56	27	60	55	35	65	46	46	34	31	43	39	62	49	46	64	61	52
7.	Ingenuous	40	41	43	55	32	58	43	54	48	65	55	55	40	44	45	51	52	49	56	58	49	37
8.	Insecure	22	32	15	27	14	43	50	45	64	78	65	71	33	38	40	55	39	56	63	48	38	- 36
9.	Introverted	25	25	14	25	18	36	47	70	33	57	62	50	51	54	44	62	43	55	60	23	24	21
10.	Submissive	25	34	24	38	22	61	61	78	61	38	68	74	49	52	57	64	58	66	65	59	54	- 38
11.	Irresponsible	04	07	25	33	08	44	51	57	58	64	51	64	58	61	54	68	52	61	79	40	44	31
12.	Emotionally unstable	08	16	00	23	05	32	49	66	61	60	60	64	44	53	67	63	52	73	63	55	49	31
13.	Uncultured	-13	-07	22	25	11	21	23	17	23	25	50	28	50	72	60	69	58	52	57	28	38	03
14.	Cold	03	07	10	15	08	18	28	37	47	34	57	54	50	43	65	68	57	65	56	27	43	17
15.	Quarrelsome	00	06	21	30	12	36	4 1	34	43	40	63	63	65	79	50	65	69	73	60	38	49	17
16.	Stupid	06	13	26	36	03	38	48	49	54	53	75	57	57	64	69	43	60	66	78	36	39	25
17.	Dominant	39	33	42	56	43	57	44	26	39	32	49	38	45	54	64	47	50	65	59	47	63	37
18.	Calculating	06	16	20	33	08	41	47	59	59	61	71	69	47	68	75	68	62	36	59	46	60	29
19.	Unconsicentious	00	00	26	35	10	39	46	44	51	50	84	54	64	57	69	73	53	67	42	38	41	22
20.	Warm	26	36	32	40	23	60	52	46	24	62	44	41	15	20	29	34	22	42	33	56	67	49
21.	Extraverted	15	22	24	32	19	46	36	20	23	40	50	28	56	46	57	47	50	46	50	50	51	- 39
22.	Cultured	28	26	29	39	42	39	34	34	26	33	30	18	-01	20	12	18	15	19	17	32	21	58

Note. Self-report act composites are above the diagonal, self by partner act composites are in the diagonal, and partner-report act composites are below the diagonal. For all analyses N = 105. For correlations of .19 or greater, p < .05, two-tailed. For correlations of .24 or greater, p < .01, two-tailed. For correlations of .30 or greater, p < .001, two-tailed. Decimal points omitted.

The varimax-rotated solutions using untransformed scores are shown in Table 3. The five factors were labeled *Responsible– Stable, Insecure, Antagonistic–Boorish, Sociable,* and *Culture.* The factor structures of both the self- and partner-report analyses were quite similar, although several differences are worth noting.

In the self-report data source, the factor loadings for the submissive, irresponsible, unconscientious, and stupid act composites were highest for the Insecure factor. In the partner-report data source, the factor loadings for these four composites were highest for the Antagonistic-Boorish factor. For the self-report data source, the factor loading for the extraverted act composite was highest for the Antagonistic-Boorish factor. For the partner-report data source, the factor loading for the extraverted act composite was highest for the Sociable factor. Using the selfreport data source, the factor loading for the intelligent act composite was highest for the Culture factor. For the partner-report data source, the factor loading for the intelligent act composite was highest for the Culture factor. For the partner-report data source, the factor loading for the intelligent act composite was highest for the Responsible factor. The highest factor loadings for all other act composites showed correspondence between the self and partner data sources.

The labels for the five factors do not capture the full complexity of each factor. The Responsible–Stable factor consists of the conscientious, responsible, emotionally stable, secure, and agreeable act composites. Conceptually, it appears to be a blend of two factors from the five-factor models, Emotional Stability and Conscientiousness.

The Insecure factor consists of the insecure (highest factor loading), introverted, submissive, emotionally unstable, and irresponsible act composites. Conceptually, this factor most closely resembles the low end of Emotional Stability on fivefactor models. High loadings on this factor for introverted and submissive (both originally derived from Factor 1 of the fivefactor model) suggest that desurgency is a substantial component of insecurity. The term *insecure* seems to capture the weak elements of desurgency, along with the elements of neuroticism typically associated with emotional instability. These findings corroborate the Wiggins, Trapnell, and Phillips (1988) revision of the IAS scales, in which the first major axis runs from Dominant-Assured to Submissive-Unassured.

The Antagonistic-Boorish factor consists of act composites from uncultured, cold, quarrelsome, stupid, dominant, and unconscientious. This factor most closely resembles the low end of Agreeableness on the five-factor model. Nonetheless, composites from other five-factor dimensions have their highest loading on this factor. Thus, dominant (high Factor 1), unconscientious (low Factor 3), and uncultured (low Factor 5) all have high loadings on the Antagonistic-Boorish factor.

The Sociable factor consists of two act composites, extraverted and warm. Conceptually it is similar to, although not as robust as, Norman's Surgency factor (1963), Digman and Inouye's Extraversion (1986), and Eysenck's Extraversion (Eysenck & Eysenck, 1975). Warm is the highest loading composite on this factor. Extraverted has a high loading for the selfreport data source, but only a moderate (and not the highest) loading for the partner data source.

The Culture factor consists of two act composites, cultured and intelligent. The intelligent act composite has only a moderate, and not the highest, loading on this factor in the partner act report. This factor is representative of similar factors such as Norman's Culture (1963), Digman's Intellect (Digman & Inouye, 1986; Digman & Takemoto-Chock, 1981), and Goldberg's Intellect (1983).

Table 3	
Varimax Rotated Principal-Components Analysis of the 20 Act Composit	ites

	Un	it weig	hted self summe	and part d	ner			Self-repo	ort			Pa	rtner rep	ort	
Act composite	I	П	III	IV	v	I	П	III	IV	v	I	п	III	IV	v
Conscientious	89	17	-05	19	-06	87	14	03	19	04	85	24	-11	16	-10
Responsible	88	16	-08	04	01	87	15	03	-01	05	88	19	-13	04	-05
Emotionally stable	75	04	31	11	18	75	11	32	14	17	68	-12	23	17	37
Secure	70	08	23	25	31	65	14	13	41	17	72	04	28	18	44
Agreeable	54	31	21	46	36	56	25	11	51	30	57	22	24	48	32
Insecure	12	89	05	20	14	23	81	04	31	15	12	85	12	21	16
Introverted	22	77	28	-25	07	22	72	33	-19	13	17	79	29	-03	09
Emotionally unstable	05	75	34	32	-01	08	65	20	58	-06	03	74	40	10	-04
Submissive	23	- 75	27	36	14	28	65	28	46	04	17	20	69	50	17
Irresponsible	-02	58	58	17	26	-03	63	43	16	29	-03	50	64	27	25
Uncultured	04	02	84	09	-11	09	16	85	08	-07	-03	-07	83	16	05
Quarrelsome	05	24	83	22	-06	04	31	63	42	-17	09	28	86	07	-03
Cold	04	23	80	09	05	06	30	78	14	02	04	39	74	-11	-07
Unconscientious	06	49	72	05	20	14	65	48	11	14	-02	34	77	18	21
Stupid	17	46	70	04	02	18	59	58	04	03	05	44	71	14	08
Dominant	49	04	70	04	22	43	07	64	27	27	55	13	67	-04	02
Warm	28	38	12	77	14	32	22	11	72	23	22	34	10	80	11
Extraverted	19	05	54	65	14	20	0	37	71	26	19	-01	61	58	-05
Cultured	13	21	-07	14	86	17	18	-07	17	86	20	27	-01	09	74
Intelligent	57	04	17	07	59	45	18	11	37	53	67	-05	07	01	50

Note. N = 105 unit-weighted self- and partner reports summed, untransformed self-report, and untransformed partner report. The act composites within each factor are ordered by the magnitude of the factor loadings. The highest factor loading for each variable is boldfaced in each analysis. Factor labels are I, Responsible–Stable; II, Insecure; III, Antagonistic–Boorish; IV, Sociable; and V, Culture. Decimal points omitted.

Factor Analyses Correcting for Possible Response Sets

We made several data transformations to correct for the possibility that the positive manifold in the matrix of act composite correlations might bias the obtained factor structure (Goldberg, 1987, personal communication; McCrae, 1987, personal communication). The first transformation involved summing, with unit weighting, the scores for each trait for the self-reported and partner-reported data sources. This transformation was intended to remove that portion of the positive manifold that is due to response set, on the assumption that the response sets operating for the two data sources are uncorrelated. Simultaneously, this transformation retains that portion of the positive manifold that is due to general activity level differences among subjects. The correlation matrix of act composites after this transformation is shown in Table 4. The solution was held to five factors, as shown in Table 3.

The factors from this solution show a close parallel with solutions based on untransformed scores in Table 3. The five major factors found in the untransformed data were replicated in these composited data. Thus, removing shared variance among act composites that is due to possible response sets, but retaining shared variance that is due to activity level, provides a strong replication of the five factors that emerged in the untransformed data.

Factor Analyses Correcting for Response Sets and Activity Level

Studies that use bipolar trait-rating scales generally eliminate activity-level variance by using a forced-choice method of scaling items. The possibility of a single individual performing a high frequency of both quarrelsome and agreeable acts, for example, could never be discovered using a bipolar scale with *quarrelsome* as one anchor and *agreeable* as the other. To render these act-report data more comparable to bipolar trait-rating data on this dimension, we performed a transformation to remove shared variance among act composites that might be due to either a response set or TAP.

The following transformations were conducted separately for both self- and partner-report act composites. First, we conducted an unrotated principal-components analysis for the 20 act composites. We assumed that the first principal component would contain the variance attributable to the common factor of activity level. Second, we partialed out the first principal component of each of the 20 act composites. Third, we summed the self- and partner-report act composites with unit weighting. Fourth, we analyzed the correlation matrix of summed residuals scores using a principal-components analysis, followed by varimax rotation to five factors. Six factors had eigenvalues exceeding unity. A scree plot (Cattell, 1966), however, suggested five factors. The results are shown in Table 5. It is interesting to note that when this transformation is conducted, the positive manifold was eliminated and bipolarity emerges in the correlation matrix of the residuals (see Table 4).

With several notable exceptions, this solution provides a remarkable replication of five-factor solutions found by Norman (1963), McCrae and Costa (1985b), Digman and Inouye (1986), and others. Two factors show nearly perfect congruence with the five-factor model. Conscientiousness is replicated perfectly,

Act composite	-	5	3	4	s	و	٢	8	6	10	11	12	13	14	15	16	17	18	19	20	21
Dominant Submissive Extraverted Agreeable Quarrelsome Warrn Conscientious Unconscientious Responsible Emotionally unstable Emotionally unstable Emotionally unstable Emotionally unstable functured Uncultured Culture Culture Scure Scure Stupid Ingenuous Stupid Ingenuous	8502225125125125125125125125125125125125125	6 - 82 - 82 - 22 - 22 - 22 - 22 - 22 - 2	8414228555555555555555555555555555555555	60381112 60381112 60381112 60381112 60381112 60381112 6038110 6038110000000000000000000000000000000000	8882 188484848658486674842°	32332843384528648484848	+2+2+2+288552+222=4 +2+2+2+288552+222=4 +2+2+2+2=2=2=2=2=2=2=2=2=2=2=2=2=2=2=2=	33238651256222525555555555555555555555555555	-00 -00 -00 -00 -00 -00 -00 -00 -00 -00	64-1-328-24-268-26-26-26-26-26-26-26-26-26-26-26-26-26-	22323326688994 61 588233425545	86228888888919556558888889556556 866256558888889195555555	382238232823282328232 3822382323823232323	302-21-1-44-1-1-2022-2523-233-233-233-233-232-232-232-232-		0339444 0339444 0339444 0339444 0339444 0339444 0339444 0339444 0339444 0339444 0339444 0039444 0039444 0039444 0039444 0039444 0039444 0039444 0039444 0039444 0039444 0000000000	18023332555555555555555555555555555555555	05 05 05 05 05 05 05 05 05 05	2641 5423953542855352828		444464888888888888888888888888888888888
N = 105. Correlation: 05, two-tailed. For corre	s for act	compo of .24 of	site scor. r greater,	es are at $p < .01$.	ove the two-tail	diagona led. For	l, correls correlati	ttions be ons of .3	stween n 10 or gre	esiduali. ater, p <	zed act	compos wo-taile	ite score d. Decir	s are be nal poin	clow the ts omitt	diagona ted.	ll. For co	orrelatic	ons of .1	9 or gre	ater,

with conscientious and responsible loading positively, and unconscientious and irresponsible loading negatively. The Intellectance-Culture factor is also replicated nearly perfectly, with cultured and intelligent loading positively and stupid loading negatively. Agreeable also shows moderate loading on this factor.

A Dominant-Assured factor analogous to the Surgency factor on five-factor models emerges, with dominant loading positively and submissive loading negatively. In contrast to five-factor models, however, insecure and unstable load negatively on this factor. Also unlike five-factor models, extraversion and introversion form a separate factor (along with warm) and do not load on the Surgency factor.

The fifth factor may be labeled Agreeable-Stable and represents a blend of Factors II and IV from previous five-factor models. Thus, stable and secure (IV+) show positive loadings on this factor, whereas cold and quarrelsome (II-) show negative loadings. Although the confluence of Factors II and IV departs from traditional five-factor models, this blend has also been found by others (Norman, personal communication).

In sum, we found the strongest congruence with traditional five-factor models using a data transformation that partials out shared variance due to both response sets and general activity level. Conscientiousness and Culture–Intelligence were recaptured nearly perfectly. Surgency emerged as a separate factor, but it separated from extraversion and contained negative loadings for insecure and unstable. Finally, Emotional Stability and Agreeableness, two separate factors on traditional five-factor models, combined to form a single factor.

Procrustes Analyses of the Act Composites

We conducted several procrustes analyses to determine if the act composites could be fit to the five-factor structure. The values in the target matrices were set to the appropriate 0s and 1s. The 20 act composites were then rotated to an oblique procrustes solution. The self-, partner-, and unit-weighted summed self and partner scores did not successfully rotate to the target matrix. The effects of activity-level variance appear to have confounded this solution. When the effects of activity-level variance are removed, however, the procrustes structure fits the five-factor model exceptionally well (see Table 6). There are three deviations from the targeted solution worth noting: The dominant act composite loadings were equal in magnitude for both the Surgency and Emotional Stability factors, and the uncultured act composite did not clearly load on a single factor.

Location of Ingenuous and Calculating in the Factor Space

Buss and Craik (1985) argued that the categories of ingenuous and calculating may not be easily subsumed by the fivefactor model. Conceptually, they should be blends of surgency and quarrelsomeness (calculating) and agreeableness and submissiveness (ingenuous; Wiggins, 1979). To determine where these variables lie in the current factor space, we conducted a series of standard extension analyses (Gorsuch, 1983). These analyses were performed separately for the untransformed, summed, and residualized solutions.

The ingenuous and calculating act composites were regressed

Correlations Between Act Composites, Self- and Partner-Report Scores Combined

Residualized composite	Conscientious	Intellectance- culture	Dominant- assured	Extraverted	Agreeable- stable
Irresponsible	-83	-05	-18	08	-04
Conscientious	78	04	02	05	43
Unconscientious	-78	-27	12	22	-06
Responsible	64	09	11	26	46
Cultured	-10	80	-03	01	06
Intelligent	26	64	35	04	21
Stupid	-38	-61	08	24	-01
Agreeable	23	45	10	-31	41
Uncultured	-25	-47	44	-13	-25
Insecure	-03	16	- 79	33	-10
Dominant	11	06	77	07	-08
Submissive	-07	06	-75	06	-03
Emotionally unstable	01	-19	-61	08	-45
Introverted	-28	01	02	74	-22
Extraverted	02	03	21	-73	-24
Warm	16	11	-47	-67	13
Secure	24	10	22	-12	69
Cold	-08	-24	39	02	-68
Emotionally stable	26	-05	37	00	66
Quarrelsome	-10	48	32	-15	-60

Table 5	
Factor Loadings for Residualized Combined Self and Partner Act Composites	5

Note. N = 105. The first unrotated principal component was regressed against each of the 20 composites. The residuals were then analyzed by using principal-components analysis followed by varimax rotation. The highest factor loading for each variable is in boldface. Decimal points omitted.

Table 6

	Obli	que Procrustes An	alvsis of	f Summed ana	l Residua	lized i	20 Act	Composites
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Residualized composite	Surgency	Agreeableness	Conscientiousness	Ernotional stability	Culture
Dominant	46	-46	06	31	-17
Submissive	-51	28	-05	-50	-07
Extraverted	64	11	-05	-05	07
Introverted	-68	-36	11	-48	-07
Agreeable	15	48	05	19	-37
Quarrelsome	38	-65	07	-30	30
Warm	18	70	06	05	07
Cold	30	-73	05	36	08
Conscientious	-13	14	78	29	13
Unconscientious	-09	-05	-71	26	28
Responsible	-22	-06	60	37	04
Irresponsible	-17	23	-79	08	11
Emotionally stable	15	27	17	83	19
Emotionally unstable	-41	-14	12	-77	11
Secure	16	40	12	69	-01
Insecure	-78	15	02	-73	-19
Cultured	02	22	-20	09	-61
Uncultured	37	-36	-15	18	34
Intelligent	24	-01	-07	15	-68
Stupid	-15	-21	-19	16	51
Sum of squares	2.77	2.69	2.29	3.52	1.67

Note. N = 105. The highest factor loading for each variable is boldfaced. Decimal points omitted.

on the factor scores for each act factor in each analysis. The act composites were residualized before attempting to locate them in the residualized act factor space. The beta weight in the regression equation can be interpreted as a factor loading for these composites.

The highest beta weights for both the ingenuous and calculating act composites were with the residualized conscientious act factor. The Ingenuous act composite had a beta weight of .24, and the calculating act composite, a beta weight of -.20, indicating a poor fit in the factor space. One may surmise that these two act composites are not blends of the act factors derived in this study.

Correlations With Personality Measures From Six Data Sources

We calculated five factor composites using the summed (self and partner) residualized act composites with the highest loadings for each factor. The act factor composites are Dominant-Assured (insecure, dominant, submissive, and emotionally unstable act composites), Extraverted (extraverted, introverted, and warm act composites), Agreeable–Stable (cold, secure, emotionally stable, and quarrelsome act composites), Conscientiousness (conscientiousness, irresponsible, unconscientious, and responsible act composites), and Intellectance–Culture (culture, intelligent, stupid, and agreeable act composites). Factor composite scores were calculated by taking the mean of the act composites representing each factor.

These composites were then correlated with trait-rating measures of the five-factor model from each of six data sources and with scales from the IAS, CPI, EPQ, CSES, and COES. To simplify the presentation, we present only the significant correlates of each factor composite. These results are shown in Tables 7– 11. Variables in the first section of each table represent measures that illustrate how a particular act factor maps on to definitionally defined trait markers. Variables in the second section are other significant correlates of the act factor.

Dominant-Assured. Table 7 shows the significant correlates of the Dominant-Assured composite for each of the six data sources. Measures of surgency and dominance (positive) and submissiveness (negative) show the strongest correlations with this act composite. Following closely are correlations with EPQ Neuroticism (negative) and the adjective assessments of emotional stability from a variety of data sources, including self, partner, father, and interviewers. Additional correlates include IAS Unassuming (negative), IAS Ambitious and Arrogant (positive), and EPQ Psychoticism (positive). Self-esteem is strongly correlated with this act factor. Overall, the correlations between the Dominant-Assured act factor and more traditional personality assessments from a variety of sources show a powerful convergence between this factor and Surgency and Emotional Stability.

Extraverted. This act composite represents a relatively "pure" act index of introversion–extraversion, containing act clusters only from extraversion, introversion, and warmth. Its correlates, shown in Table 8, are similarly "narrow band." Indexes of extraversion show the strongest positive correlations, whereas IAS measuring introversion show the strongest negative correlations. Also positively correlated are adjectival mea-

sures of surgency and CPI Social Presence, Dominance, and Capacity for Status.

Agreeable-Stable. In general, this act factor shows the strongest and most consistent correlations with various measures of agreeableness (positive) and quarrelsomeness (negative; see Table 9). A cluster of related measures also show correlations, including IAS Warm, Gregarious, and Unassuming (positive) and IAS Cold, Arrogant, and Calculating (negative). Emotional stability shows consistent positive correlations within the self and partner data sources, but these links are not as strong than the links between Dominant-Stable and emotional stability. In general, this act composite appears to represent a solid recapturing of the Agreeable factor from the five-factor model, with indications of stability showing positive links.

Conscientiousness. Table 10 shows the correlations between the "pure" Conscientiousness act factor and the traditionally assessed personality variables. The most consistent correlations are with the adjective measures of Conscientiousness. Also positively correlated is the CPI Socialization scale. Negatively correlated is the EPQ Psychoticism scale, which is saturated with items reflecting impulsivity. The additional correlates of this factor provide insight into the controversy surrounding the naming of this third factor (Digman & Inouye, 1986). Particularly interesting are the correlations with IAS Lazy (negative) and Ambitious (positive) within each of the two data sources used for the IAS. This provides support for Digman and Inouye's contention that this factor contains significant elements of "industry" or "will to achieve." Future decisions about naming this factor could reflect these important components.

Intellectance-Culture. This relatively "pure" recapturing of the fifth factor is interesting in that this factor often proves to be the most difficult to find. Its correlates are strongest and most consistent with the adjective measures of this factor, which were significant for the data sources of self, partner, friends, and interviewers (see Table 11). Positive correlations were also found for CPI measures of Tolerance and Intellectual Efficiency. These latter two correlates provide support for McCrae and Costa's (1985b) contention that this fifth factor contains an element of "openness to experience" (CPI Tolerance), as well as Digman and Inouye's (1986) contention that this factor has a strong element of good intellectual functioning.

In sum, the correlations between the act factor composites and the personality data derived from six sources supports and elaborates in important ways the meanings of each of the five factors.

Discussion

How well does the structure of act-report data correspond to the five-factor models of personality? Two somewhat different answers can be given, depending on the assumptions made. One model assumes that general activity level represents legitimate personality variance and that structural models of personality should reflect the inclusion of that variance. Under this assumption, factor analyses produced five factors: Responsible–Stable, Insecure, Antagonistic–Boorish, Sociable, and Cultured–Intelligent. These factors blend the various elements of the traditional five-factor model in ways that depart substantially from that model.

Table 7 Correlates of the Dominant-Assured Act Factor

Scale	Pearson r	Data source
IAS—Submissive	66***	Partner
IAS-Dominant	.62***	Partner
Adi.—Surgency	.55***	Partner
EPO-Neuroticism	55***	Self
Adi Emotional Stability	.52***	Partner
AdiEmotional Stability	.52***	Totals
Adi —Surgency	50***	Totals
CPI_Dominance	46***	Self
IAS_Dominant	45***	Self
Adj Emotional Stability	40***	Self
IAS Submission	43***	Self
Adi Summar	40***	Self
Adj. Emotional Stability	20###	Interviewe
Adj.—Emotional Stability	.39	Eather
Adj.—Surgency	.33***	Fauler
Adj.—Emotional Stability	.30**	Father
Adj.—Surgency	.24+	Interviewer
IAS—Extraverted	,21+	Partner
IAS—Introverted	20*	Partner
CSESGeneral Esteem	.57***	Self
COESGeneral Esteem	.53***	Partner
IAS-Ambitious	.43***	Partner
COES—Physical	.42***	Partner
CPI-Intellectual Efficiency	.40***	Self
COES—Achievement Abilities	.39***	Partner
CSES—Achievement Abilities	.36***	Self
IAS-Unassuming	35***	Partner
IAS-Warm	34***	Self
IAS-Lazy	33***	Self
EPO-Psychoticism	.32***	Self
IAS_Lazy	32**	Partner
IAS-Cold	.29**	Self
CPI-Social Presence	.28**	Self
CPIWell Being	.28**	Self
CSES_Physical	26**	Self
LAS_Gregarious	25**	Self
IAS_Ambitions	25**	Self
IAS-Calculating	7 <u>4</u> **	Self
	_ 33**	Self
IAS Amogent	73**	Partner
	_ 22*	Partner
1AS Querreleane	22	Salf
	.22	Self
IAS Arrogant	,21*	Salf
IAS—Ingenuous	-,21*	Self
Cri-Capacity for Status	,20*	Sell

Note. IAS = Interpersonal Adjective Scale, Adj. = Adjective trait ratings, EPQ = Eysenck Personality Questionnaire, CPI = California Personality Inventory, CSES = California Self-Evaluation Scales, COES = California Observer Evaluation Scales.

* p < .05. ** p < .01. *** p < .001.

Thus, Conscientiousness (II) blends with Emotional Stability (IV). Introversion (I–) and Submissiveness (I–) blend with Instability (IV–). Dominance (I+) blends with Quarrelsome (a blend also found by Borkenau, 1986, and Buss & Craik, 1986) and Cold (II–), as well as with Stupidity (V–). Extraversion (I+) blends with Warmth (II+). Only cultured and intelligent recaptured a relatively "pure" five-factor dimension, although this was unipolar rather than bipolar. On the basis of these analyses, one must conclude that the structure of act-report data differs substantially from structures produced by more traditional assessments of personality.

A different answer is produced if one assumes that general

activity level variance distorts the structure of personality data and should be partialed prior to factor analysis. When we acted on this assumption, the structure of act-report data recaptured closely the frequently found five-factor model of personality. Conscientiousness (II) and Intellectance-Culture (V) were recaptured nearly perfectly. The other three factors contained modest but important deviations from the five-factor model.

First, Introversion-Extraversion separated from the first factor to form its own factor. It is worth noting that this separation occurred for every factor analysis that was conducted on these act report data, regardless of the assumptions of the model. Second, Emotional Stability did not form a separate factor, but instead blended with Dominance on one factor and with Agreeableness on another factor.

Two independent lines of evidence support the idea that the blend of dominance and security should be given a substantive interpretation. First, Wiggins et al. (1988) found self-assurance to be such a strong component of dominance that they renamed this principal axis of the circumplex model *Dominant-Assured*. Second, evidence from several studies suggests that insecure or anxious people behave more submissively (e.g., Alden & Cappe, 1981; Alden & Safran, 1978; Glasgow & Arkowitz, 1975; Goldfried & Sobocinski, 1975; Schwartz & Gottman, 1976; Vitkus

Table 8

		and the second
Scale	Correlation	Data source
IAS-Extraverted	.51***	Partner
EPQ-Extraverted	.49***	Self
IAS-Introverted	46***	Self
IAS—Introverted	42***	Partner
Adj.—Surgency	.41***	Self
Adj.—Surgency	.40***	Total
IAS-Extraverted	.37***	Self
Adj.—Surgency	.35***	Partner
Adj.—Surgency	.34***	Interviewer
Adj.—Surgency	.28*	Father
IAS—Aloof	43***	Self
CPI-Social Presence	.38***	Self
CSESInterpersonal Esteem	.35***	Partner
CPI-Dominance	.34***	Self
IAS—Submissive	33***	Self
IAS—Dominance	.30**	Self
COES—General Esteem	.28**	Partner
CPI-Capacity for Status	.28**	Self
IAS-Dominant	.25**	Partner
IAS—Arrogant	.25**	Partner
IAS—Submissive	24*	Partner
IASWarm	.24*	Partner
IASQuarrelsome	23*	Self
COES—Achievement Abilities	.22*	Partner
CSES—General	.21*	Self
IASAloof	.21*	Partner
CSES—Interpersonal Esteem	.20*	Self
CPI-Self Control	.20*	Self
IASGregarious	.20*	Self
COES-Physical Esteem	.19*	Partner

Note. IAS = Interpersonal Adjective Scale, EPQ = Eysenck Personality Questionnaire, Adj. = Adjective trait ratings, CPI = California Personality Inventory, CSES = California Self-Evaluation Scales, COES = California Observer Evaluation Scales.

* p < .05. ** p < .01. *** p < .001.

 Table 9

 Correlates of the Agreeable–Stable Act Factor

Scale	Correlation	Data source
Adi.—Agreeable	.53***	Partner
Adi.—Agreeable	.52***	Total
AdjEmotional Stability	.46***	Partner
IAS-Agreeable	.45***	Partner
IAS—Quarrelsome	45***	Partner
IAS-Ouarrelsome	41***	Self
AdiAgreeable	.53***	Partner
Adj.—Agreeable	.36***	Self
CPI-Well Being	.33***	Self
IASAgreeable	.32***	Self
Adi.—Emotional Stability	.30**	Total
EPQ-Neuroticism	24*	Self
CSES—General Esteem	.46***	Self
CSES—Achievement Abilities	.46***	Self
Adj.—Openness	.42***	Partner
IAS—Ambitious	.41***	Partner
IAS—Warm	.41***	Partner
IAS—Lazy	39***	Partner
IAS-Gregarious	.39***	Partner
IASArrogant	34***	Self
CPI-Tolerance	.33***	Self
IAS—Aloof	33***	Partner
Adj.—Conscientious	.32***	Partner
Adj.—Conscientious	.31***	Total
AdjOpenness	.31***	Total
IAS-Cold	30**	Partner
IAS—Unassuming	.30**	Self
AdjConscientious	.27**	Self
CSES—Interpersonal Esteem	.27**	Self
IAS-Extraverted	.27**	Partner
IAS-Unassuming	.27**	Partner
IAS-Ingenuous	.26**	Self
IAS-Cold	25**	Self
IASLazy	25**	Self
Adj.—Surgency	.25*	Friend
IASArrogant	25*	Partner
IAS-Gregarious	.25*	Self
CPI-Socialization	.24*	Self
IAS—Calculating	24*	Self
CPI-Responsible	.23*	Self
CSES—Physical Esteem	.23*	Self
IAS—Ambitious	.23*	Self
IAS-Aloof	22*	Self
IAS—Warm	.22*	Self
IAS—Calculating	21*	Partner

Note. Adj. = Adjective trait ratings, IAS = Interpersonal Adjective scale, CPI = California Personality Inventory, EPQ = Eysenck Personality Questionnaire, CSES = California Self-Evaluation Scales, COES = California Observer Evaluation Scales.

* p < .05. ** p < .01. *** p < .001.

& Horowitz, 1987). These findings corroborate the close link between submissiveness and insecurity found in act-report data.

The correlations between these act factor composites and traditional assessments of personality illuminated the nature of each of these five factors and supported several suggestions regarding the renaming of these factors. Two of these findings are particularly important. First, the correlations between the Conscientiousness factor and IAS Ambitious (positive) and IAS Lazy (negative) scales support Digman and Inouye's (1986) suggestion that this third factor has strong elements of work orientation and industry. They suggest that an appropriate name for this factor is *Will to Achieve*, and the empirical correlates found here support that suggestion.

Second, there has been much controversy surrounding the fifth factor. McCrae and Costa (1985b) argued that Openness to Experience provides a more accurate label for this factor. In contrast, Digman and Inouve (1986) argued that Intellect is a more accurate label. The correlates of this factor in the present data provide support for both contentions. It is significantly correlated with CPI Tolerance, supporting the argument for the Openness designation. It is also significantly correlated with CPI Intellectual Efficiency, supporting the argument for the Intellect designation. In addition, we found a significant correlation with CPI Capacity for Status, and Costa and McCrae (1988) found a significant correlation between Openness and level of education. Taken together, these results suggest that the fifth factor represents a complex blend of seeking cultural experiences, becoming educated, showing tolerance for diversity, being prone to rise in status and education, and performing intelligent acts in everyday life.

The ingenuous and calculating act composites, which conceptually represent blends of the 1st two factors in the five-factor models, were included to test the hypothesis that they may not be well represented by existing five-factor models (Buss & Craik, 1985). Standard extension analyses revealed that ingenuous and calculating did not fit into the factor space very well. Further research is needed to determine whether these catego-

Table 10 Correlates of the Conscientious Act Factor

Scale	Correlation	Data source
Adj.—Conscientious	.54***	Total
Adi.—Conscientious	.52***	Self
Adi.—Conscientious	.55***	Partner
Adj.—Conscientious	.31***	Interviewer
IAS—Lazy	56***	Partner
IAS-Lazy	46***	Self
IAS-Ambitious	.47***	Partner
IAS—Ambitious	.46***	Self
EPO-Psychoticism	37***	Self
CSES—General Esteem	.33***	Self
CSES—Achievement Abilities	.32***	Self
IAS—Quarrelsome	29**	Partner
CPI-Socialization	.27**	Self
IAS—Ouarrelsome	26**	Self
EPO-Lie	.25**	Self
IAS-Dominance	.23*	Partner
Adi.—Agreeable	.22*	Partner
COES—Achievement Abilities	.22*	Partner
IAS—Agreeable	.22*	Partner
AdjEmotional Stability	.21*	Partner
CPI—Well Being	.21*	Self
IAS—Submissive	21*	Self
CPI—Dominance	.20*	Self
COES—General Esteem	.19*	Partner
COES—Physical Esteem	.19*	Partner

Note. Adj. = Adjective trait ratings, IAS = Interpersonal Adjective Scale, EPQ = Eysenck Personality Questionnaire, CSES = California Self-Evaluation Scales, CPI = California Personality Inventory, COES = California Observer Evaluation Scales.

* p < .05. ** p < .01. *** p < .001.

Table 11 Correlates of the Intellectance-Culture Act Factor

Scale	Correlation	Data source
Adj.—Intellect	.47***	Total
Adj.—Intellect	.47***	Partner
AdjIntellect	.35***	Self
AdjIntellect	.28**	Interviewer
Adj.—Intellect	.26*	Friend
CPI—Intellectual Efficiency	.20*	Self
CPI—Capacity for Status	.38***	Self
CPI-Tolerance	,33***	Self
CSESTask	.33***	Self
EPO-Lie	.27**	Self
CSES-Interpersonal Esteem	.25**	Self
IAS—Quarrelsome	25**	Self
IAS—Ambitious	.24*	Partner
IAS—Agreeable	.20*	Self

Note. Adj. = Adjective trait ratings, CPI = California Personality Inventory, CSES = California Self-Evaluation Scales, EPQ = Eysenck Personality Questionnaire, IAS = Interpersonal Adjective Scale. * p < .05. ** p < .01. *** p < .001.

ries represent classes of acts not easily subsumed by five-factor models.

Finally, when forced to fit the procrustean solution, the untransformed scores do not fit into the five-factor model. The pervasive effects of activity-level variance prevent a comfortable rest in the procrustean bed. Removing activity-level variance and analyzing the transformed scores results in an oblique procrustes rotation that fits the five-factor model closely.

Several cautions and limitations must accompany the interpretation of these results. First, there are limitations because of the methodology of act reports. Although we used two data sources to assess retrospectively the act performance of subjects, there may be memorial and other biases that yield data different from those yielded by direct observation. The use of two data sources, however, lends credibility to the results that emerge across them. Errors in one data source are unlikely to be correlated with errors in the other data source.

A second limitation is that only four markers were chosen to represent each factor from the five-factor model. Future studies could use a larger array of markers for each factor. Particularly important in this context is the need to sample the domain of Openness, which may be a better description than Culture of the fifth factor in five-factor models (McCrae & Costa, 1985b; McCrae et al., 1986), facets of which were not well represented in these act data.

A third limitation pertains to the sample size and composition. Although the ratio of subjects to variables (5:1) is adequate by most factor-analytic standards (cf. Kline, 1987), replication with larger samples is clearly desirable. The sample composition could be expanded beyond the use of dating couples attending college to include more diverse segments of the population.

Given these limitations and cautions, two general conclusions seem warranted. First, the structure of personality discovered depends on the nature of one's assumptions. In particular, the structure changes when activity-level variance is included rather than excluded. Second, given the radically different starting point (act reports) for the current data, this study provides compelling support for some version of the five-factor model as a basic structure of personality.

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Appendix

Sample Acts From the 22 Categories

Category	Sample act	Category	Sample act
Dominant	She demanded that he run an errand. He set goals for the group.	Emotionally stable	She remained composed during the situation where there was a great deal of
Submissive	She continued to apologize for the minor mistake.		pressure. He took the setback well and didn't let it
	He accepted verbal abuse without defending himself	Emotionally unstable	upset him.
Extraverted	She danced in front of a crowd. He entertained the party crowd with some	Emotionally unstable	nothing about. He got upset about the work he needed to
Introverted	jokes. She stand at home and untched TV alone		do, instead of doing it.
miloverica	on a Saturday night. He walked into a roomful of people	Secure	She openly admitted a personal weakness. He gave credit to others when they
Agreeable	without talking to anyone. She offered to help her friend move	Insecure	She agreed with what was said without taking her own stand
	something. He volunteered to make dinner for his	Cultured	He put himself down. She went to the art exhibit.
Quarrelsome	friends on the weekend. She made belitting comments about the		He displayed knowledge of a foreign culture.
Warm	He yelled at someone.	Uncultured	She spoke with her mouth full. He made off-color jokes in mixed
*** 41 111	He hugged his friend as they greeted.	Intelligent	company.
Cold	She laughed when the person hurt himself. He glared at the stranger.	Intelligent	view.
Conscientious	She checked out every detail on the task she completed.		He gave a definition of a large word when no one else knew what it meant.
Unconscientious	He paid his bills on time. She forgot to thank her friends when they	Stupid	She made the same mistake she had made before.
hei hei	helped her.		He could not follow the simple verbal instructions.
_	mistakes.	Calculating	She made a friend in order to obtain a
Responsible	She saved her money for the future. He volunteered his time to the community charity		He asked "innocent" questions intending to use the information against someone.
Irresponsible	She purchased an item without considering whether she could afford it.	Ingenuous	She did not object to her partner spending time with a member of the opposite sex.
	He forgot to pick up someone after he had promised to do so.		He believed his friend's excuse even though it sounded unlikely.

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