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Higher-Order Factors of the Big Five

John M. Digman
Oregon Research Institute

Estimated factor correlations from 14 studies supporting the 5 factor, Big Five model of personality trait organization—5 studies based on children and adolescents, 9 on adults—were factor analyzed. Two higher-order factors were clearly evident in all studies. One was principally related to the Big Five trait dimensions Agreeableness, Conscientiousness, and Emotional Stability; the other, the dimensions Extraversion and Intellect. Two models, one for children and adolescents, the other for adults, were tested by confirmatory factor analysis with generally excellent results. Many personality theorists appear to have considered one or both of these 2 metatraits, provisionally labeled α and β.

The past decade has witnessed the renaissance of a factor model of personality trait organization known as the Big Five, or five-factor model. Although the model was evident in the early study of temperament by Cattell (1933) and the work of Fiske (1949) and was later spelled out in its essential form by Tupes and Christal (1961), Tupes and Kaplan (1961), Norman (1963), and Borgatta (1964), it was virtually ignored until the 1980s, when it was rediscovered by several investigators (e.g., Costa & McCrae, 1985; Digman & Takemoto-Chock, 1981a; Goldberg, 1981; John, Angleitner, & Ostendorf, 1988; McCrae & Costa, 1989) as "an adequate taxonomy of personality attributes" (Norman, 1963, p. 574). Although there are differences regarding the meaning of these factors, Factor I has generally been interpreted as Extraversion or Surgency; Factor II, Agreeableness; Factor III, Conscientiousness; Factor IV, Emotional Stability; and Factor V as Intellect or Openness to Experience.

Are these factors "basic," as Costa and McCrae (1992a) have contended? That is, are they *the* fundamental trait dimensions, with nothing beyond them other than evaluation (Goldberg, 1993b)? One might also ask, where in this system is there a place for the concepts of the grand theories of the past—for example, the theories of personal growth, social interest, attachment, and the struggles between instinctual impulse and conscience?

Despite wide acceptance of the five-factor model of trait organization, several critics have noted its shortcomings. McAdams (1992), for example, although granting that the model may represent an effective scheme for the organization of trait descriptions, has noted what he believes are two basic weaknesses: First, it has little to offer with regard to the causes of personality, because it is merely descriptive in nature. Second, because it is based on typical behavior, it cannot account for exceptions to these general traits, exceptions that are the effects of situations that depart from the usual. Other critics (e.g., Block, 1995; Loevinger, 1994) have expressed their doubts that a model based on five independent dimensions of trait ratings will have anything of importance to say concerning personality development.

Although I may have been overly enthusiastic about the Big Five as a possible "grand unified theory" for personality (Digman, 1990), I have for some time (Digman & Takemoto-Chock, 1981a) felt that it could serve as a broad framework for the myriad personality constructs that have been offered by theorists from Freud (1930) and Adler (1939) to Rogers (1963) and McAdams (1985). However, despite my enthusiasm for the Big Five, it is obvious that it is not a complete theory of personality, nor have its proponents (e.g., Costa & McCrae, 1992c; Digman, 1990; Goldberg, 1993a; Saucier & Goldberg, 1995) claimed that it is. Particularly missing is any clear link with personality development, although several researchers (Ahadi & Rothbart, 1994; Digman, 1994; Digman & Shmelyov, 1996; Hagekull, 1994; Mervielde, 1994) have suggested that individual differences in infant and child temperament—presumably related to constitutional differences—may constitute the "core" of later differences in personality.

However, a few studies linking child temperament to personality, although perhaps redressing an earlier excessive enthusiasm for the influence of shared family environment, do little to bridge the chasm that has existed for too long between classical theories of personality development and factor models based on measures of individual differences in personality characteristics. The analyses reported here may be seen as an effort at throwing a rough bridge across this gap. These analyses are higher-order factor analyses of 14 Big Five studies—more specifically, analyses of the correlations of the typical five factors emerging from trait measures of broad scope. It will be argued that it is at this abstract level of conceptual organization that links with theoretical accounts of the "why" of personality may be found.

Higher-Order Factors, Orthogonal Components, and Levels of Abstraction

Because almost all published studies of the Big Five (e.g., Costa & McCrae, 1985; Goldberg, 1992b; McCrae & Costa,

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Correspondence concerning this article should be addressed to John M. Digman, Oregon Research Institute, 1715 Franklin Boulevard, Eugene, Oregon 97403-1983. Electronic mail may be sent via the Internet to jackd@ori.edu.

1989) have been based on analyses that produced orthogonal factors, a few words are in order regarding the possibility of factoring correlations based on such studies.[1] As Kerlinger (1984) has noted, "While ordinary factor analysis is probably well understood, second-order factor analysis, a vitally important part of the analysis, seems not to be widely known or understood" (p. xiv). First, the apparent orthogonality of the Big Five is a direct result of the general use of component analysis, accompanied by varimax rotation, a procedure that imposes rather than finds independent factors (technically speaking, *components,* although the distinction between factors and components is often blurred). When rotation is carried out with an oblique procedure, factors will be correlated, particularly personality factors. Further, even though one may make a strong case for orthogonal factors, as Goldberg (1993a) does, factor scores that are based on the Big Five constructs will generally produce correlated variables reflecting the five factors. The reason for this is that most of the variables that define personality factors tend to be located in clusters in the multiple-factor space. Thus, when an estimate of a factor score is formed, based on the variables in that cluster, that score will correlate with other factors scores similarly determined.[2]

Since the introduction of correlated (oblique) factors by Thurstone (1935) in his investigation of the structure of abilities and the use of this approach as particularly justified in studies of the factor structure of personality traits by Cattell (1945), the correlated factors approach has been available as an alternative to the more commonly employed uncorrelated (orthogonal) factors approach. Three widely used statistical packages, SAS, SPSS, and BMDP, all have oblique factor procedures—for example, oblimin, promax—as options, although users typically opt for varimax, an orthogonal rotation. Correlations among primary factors can be estimated in two basic ways: The primary solution may have been obtained by an oblique rotation that has produced an intercosine matrix as estimates of factor correlations (Gorsuch, 1983; Harman, 1976). Alternatively, factor scores may be estimated by forming a composite of (standardized) salient variables, either weighted in some fashion—as in the regression method of estimating factor scores—or unweighted, and the correlations then obtained from these composite variables.[3] It may also be noted that confirmatory factor analysis (CFA), as found in structural equation packages, such as EQS (Bentler, 1989), commonly provide for the estimation of factor correlations, although orthogonal solutions are also possible.

Following the tradition of Thurstone and Cattell, then, one may expect to find, at the conclusion of a factor analysis of a set of observed personality variables that personality factors will be correlated, provided one does not insist on an orthogonal solution. Like the correlated variables that initiated the analysis, one may then analyze these factor correlations, producing higher-order factors; that is, factors at a higher level of abstraction.

Possibly, a higher-order analysis of the correlations of the Big Five might lead to the Eysenck Big Two of yesteryear (Eysenck, 1947; Wiggins, 1968), or the Big Three (Eysenck, 1978) of more recent times. Eysenck (1992) has suggested that the Big Five are not really "basic," and that a level above these factors not only exists but would be found to contain the familiar Eysenck P-E-N factors. In their reanalyses and comparisons of six studies of rated personality characteristics, Digman and Takemoto-Chock (1981a) concluded that the five trait dimensions found consistently across studies "are neither inscrutable nor are they new concepts" (p. 165). Perhaps this might be true of factor-based concepts at a higher level as well. From this point of view, factor analysis does not, as a rule, "discover" new concepts; it mostly puts variables into order, often implying existing theoretical concepts, such as neuroticism (Eysenck, 1992) and openness (Costa & McCrae, 1992a).

Regardless of whatever factors a higher-order analysis might produce, the hierarchical view regarding personality constructs (Eysenck, 1947; Hampson, 1988; Hampson, John, & Goldberg, 1986) would suggest two characteristics of any possible higher-order factors based on the Big Five: (a) that the constructs would be very broad, broader even than the broad-band Big Five, and, consequently, (b) that these constructs would likely be quite abstract.

Method

Factor correlations from 14 studies were analyzed. (See Appendixes A and B. For reasons that may be obvious—most of them came from the published literature—the analyses are based on correlations, rather than raw data. These correlations, as assembled here, also permit anyone to try his or her hand at both the exploratory and the confirmatory analyses reported here.) Five were based on teachers' ratings of children or early adolescents (Digman, 1963a, 1963b, 1994; Graziano & Ward, 1992). Four were based on self-ratings by adults, using adjective descriptors (L. R. Goldberg, personal communication, 1995; John, Goldberg, & Angleitner, 1984; Yik & Bond, 1993) and two on peer ratings (Costa & McCrae, 1992a, 1992b). Two came from the revised NEO Personality Inventory (NEO-PI–R; Costa & McCrae, 1992a; Costa, McCrae, & Dye, 1991), and one from an alternative instrument for assessing the Big Five, the Personal Characteristics Inventory (PCI; Barrick & Mount, 1993). All of these studies produced five primary factors that were recognizably the Big Five factors that have now appeared in many studies of trait ratings and inventories (Digman, 1990; Goldberg, 1993b).

For three of the child-based studies (hereafter referred to as Digman 1 [1994], 2 [1994], and 3 [1963c]), factor scores were calculated as weighted (by factor loading) composites of standardized variables. Product–moment correlations of these factor scores were then used for the higher-order analyses. For the Digman and Takemoto-Chock (1981b) study, the factor correlations came from an oblique solution by promax; the correlations were taken as the intercosines of the factor axes, a departure from the approach used for the other studies and one taken

[1] In what follows, the terms *factor* and *factor analysis* are used in their general sense, referring to a dimensional analysis of data. Both technically and theoretically there are basic differences between the factor model and the principal-components model, although the practical differences are usually minimal.

[2] An example of correlated factor scores, following an analysis by principal components and orthogonal rotation may be found in a study by Costa, McCrae, and Dye (1991). Here, the estimates of factor scores were formed by unweighted summation of the items assigned to the factors.

[3] As Loehlin (1987) pointed out, many researchers form estimates of factor scores by unweighted summation of salient standardized variables. It is commonly known among researchers employing factor analysis that all methods produce scores that correlate very highly.

in an interest in comparing the results from this study with the others. For the studies of adults by John et al. (1984), the factor correlations were based on trait scales formed as unweighted composites of items, based on theoretical considerations of the Big Five model, as was true of the Graziano and Ward (1992) study of adolescents. Two of the Costa and McCrae sets of correlations were based on the five scales of the NEO-PI–R Inventory, one set from peer ratings (Costa & McCrae, 1992c), the other two from self-reports (Costa & McCrae, 1992b; Costa et al., 1991). The correlations for the third set were based on the use of Goldberg's (1992b) transparent rating scales for the Big Five (Costa & McCrae, 1992c). The correlations from the Barrick and Mount (1993) study were the correlations of the Big Five traits as measured by their inventory. The analysis of self-report data of university students in Hong Kong was based on Big Five factor correlations computed, as in the John et al. studies, from rationally constituted Big Five scales.[4] The correlations from the Goldberg study were based on composite scores formed by unweighted summation of standardized variables.

Altogether, this is certainly a very broad collection of correlations of Big Five personality factors, based on children, adolescents, and adults, and with the correlations of the five primary factors formed in different ways. Conceivably, some hypothesis-testing procedure might have been employed first, as I have for some time (Digman, 1963a) found what appeared to be meaningful factors above those obtained from first-order analyses. However, one might argue that a stronger case could be made for a fairly stable structure across studies by proceeding as though each analysis were based on an independent study, each employing exploratory, rather than confirmatory, factor analysis, with the results of all 14 analyses then compared, in a meta-analytic sense. It could also be argued that these analyses were exploring terra nova, and that an exploratory analysis would hence be more appropriate. What follows is based on both approaches, with models for CFA (two for children and young adolescents, two for adults) derived from the initial exploratory analyses. These quite similar models were then tested for goodness of fit across the studies.

The 14 sets of correlations (see Appendixes A and B) were initially factored, using the common-factor exploratory model, with squared multiple correlations as initial estimates of communality, followed by two iterations. Rotation was by varimax, reflecting initial results (Digman 1 and Digman 2) that these higher-order factors are substantially orthogonal.

Results

Exploratory Analyses

In the 14 studies, two—and only two—factors were typically evident (see Table 1), according to two generally recognized indicators: Typically, the first two eigenvalues of the correlation matrices exceeded unity, and the third was substantially below. In addition, parallel analysis (Horn, 1965) clearly suggested two factors for 12 of the studies. For two studies—Costa & McCrae 2 and John et al. 1—these initial results were somewhat problematic. The first study utilized Goldberg's (1992b) transparent scales that grouped together rating scales denoting each of the Big Five domains. The second was based on a small sample ($N = 70$) with likely sizable sampling error of the correlations. These two sets of correlations produced results differing mildly from the rest of the studies. These differences could be attributable to differences in procedure or to sampling error, or both. Results of the analyses may be seen in Table 2, where the higher-order factors have been provisionally labeled α and β. Factor α was typically indicated by Big Five factors A (Agreeableness) and ES (Emotional Stability), and generally also by C (Conscientiousness). Factor β was indicated by E (Extraversion) and I (Intellect/Openness) in all studies. Mean loadings were then calculated across the nine adult studies and across the five that were based on children and early adolescents. These mean loadings appear in Table 3.

Confirmatory Analyses

Several models were tested in this phase, using the EQS program (Bentler, 1989). The most stringent were the two models that were implied by the mean loadings across the child studies and across the adult studies. For Model 1, factor coefficients were fixed in accord with mean factor loadings of .20 and greater in the exploratory analyses; values less than .20 were fixed at zero. Factor correlations were fixed at zero. The results obtained with this model appear in Table 4.

A less stringent model fixed coefficients of .20 and greater in accord with Model 1, but allowed coefficients previously fixed at zero to be estimated, having noted that small values on Factor α often appeared for Extraversion and Intellect in the exploratory studies, and similar minor values on Factor β sometimes occurred for Agreeableness and Conscientiousness. The results obtained with Model 2 may also be seen in Table 4. The fit of the models to the obtained correlations was very good: Across all 14 studies, the comparative fit index (CFI) for Model 1 ranged from .957 to 1.000; for Model 2, the less constrained model, CFI values ranged from .981 to 1.000. A CFI value above .90 is often considered an excellent fit (Bentler, 1990).

Discussion

Given the great diversity of the data leading to the correlations on which the above analyses are based, it is remarkable that the structure of the exploratory analyses is as stable as it is across the 14 studies. The data leading to the correlations for children and adolescents involved teachers' ratings. The data from adult participants were partly based on inventories—the NEO-PI–R and the PCI—and partly on self-ratings. In addition, the factor correlations were formed in various ways, mostly based on composites formed from either weighted or unweighted summation of salient variables (i.e., with loadings beyond $\pm.50$), which in some studies had been standardized, in others not, before summation. In some studies, the variables that entered into the composites were chosen on the basis of a factor—or component—analysis; in others, they were chosen on the basis of previous studies. Despite all this variation in measurement

[4] I wish to thank Michelle Yik and Michael Bond for sharing these data with me. Although agreeing with me with regard to the structure of Western personality characteristics and their importation by means of translation into the Chinese language, they are of the belief that locally based (indigenous) personality traits may have a structure different from the Western-based Big Five (Yik & Bond, 1993). The factor scores for this study were based on unweighted, standardized composites, the variables entering into the composites as suggested by past Big Five studies. Lewis R. Goldberg and I independently selected the variables for the composites. Across the five composites our pairs of factor scores had a mean correlation of .97. These two sets were then merged to provide the data for the factor analysis.

Table 1
Mean Eigenvalues of the Factor Correlation Matrices and Mean Eigenvalues of Random Data

Source	Eigenvalue number				
	I	II	III	IV	V
Younger participants	2.283	1.462	0.910	0.418	0.228
Random data	1.204	1.086	0.997	0.894	0.737
Older participants	1.996	1.195	0.818	0.569	0.430
Random data	1.171	1.093	0.989	0.922	0.825

Note. Real and random eigenvalues for each study are available from John M. Digman.

and in the rationale for forming the Big Five composites, the two-factor solution is surprisingly robust.

The results obtained from the confirmatory analyses add strong support to the hypothesis that two—and only two—higher-order factors exist, although in most cases, the χ^2 values are significant, indicating that the model in many cases should be rejected. However, such "sharp" null hypotheses (similar to testing the null hypothesis in experimental studies) are almost always rejected with large samples; models are just that—abstract constructions that more or less accord with the reality of the data, rather than necessarily specifying observed relations of the model's parts precisely. In addition, the studies were based on quite different populations of participants, some of whom were first- and second-grade children, mostly of Asian ancestry; others were university students in Germany and Hong Kong; still others, mature adults in the United States. Given these circumstances, rejection of the null hypothesis in most cases is hardly surprising. As several authors (e.g., Bentler, 1990; Bentler & Bonett, 1980; Hoyle, 1995) have suggested, a better indication of the goodness of a model is the fit index—and the fit indices here are quite high.

But what are these factors? Do they represent something new about personality structure, or do they reflect conceptual organizations of the personality field that have already appeared in the literature, as Digman and Takemoto-Chock (1981a), concluded, following their analyses of several studies of trait ratings: "The five constructs suggested by the factors appear to be domains of research effort and theoretical concern which have long been of interest to psychologists" (p. 149)? If this is also true of the analyses reported here, what concepts might these two higher-order factors suggest?

A first suggestion is that these two higher-order factors, abstracted out of the common-factor parts of the Big Five, must reflect the hierarchical ordering of personality constructs (Goldberg, 1993a). A second is that these high-level factors, not only arising from the ubiquitous Big Five but also accounting for the relations among them, probably reflect very broad theoretical constructs.

The Hierarchical Nature of Personality Constructs

The hierarchical model of the organization of personality characteristics (Eysenck, 1947; Hampson, 1988; Hampson et al., 1986) views personality terms as arranged on an abstraction ladder, from the most specific responses through levels that are increasingly more encompassing and abstract, up to the broadband Big Five. Figure 1 is a representation of these levels, an arrangement of levels of abstraction first proposed by Eysenck (1947). (It is not, strictly speaking, a hierarchy in the classical meaning of the term but a *quasi hierarchy,* or, to use Cattell's (1966) term, a *cross-acting hierarchy.*) The analyses presented here suggest that an even broader and more abstract level of meaningful constructs may be found beyond the Big Five. It is at this level on the abstraction ladder of concepts that I believe the links with the writings of personologists as diverse as Skinner (1953), Bandura (1974), Rogers (1963), and Adler (1939) may be found.

Factors α and β as the Bases of Theoretical Systems

First, it is necessary to point out that the analyses reported here were *factor* analyses. Unlike component analysis, which maps the location of variables in the variable space, saving a few dimensions and discarding most, factor analysis is a model of causal processes. As was noted at the beginning of this report, studies of the organization of trait descriptors that have led to the Big Five have typically been carried out by component analysis, a procedure that suggested the label *Conscientiousness,* for example, for a collection of variables such as persevering, purposeful, careful, and organized. The more theoretical *factor* analyses reported here imply some broad determiners underlying and responsible for the correlations observed. What broad causes may be responsible for the common finding of positive—often sizable—correlations between, for example, Conscientiousness and Agreeableness, or between Conscientiousness and Emotional Stability?

Some interpretations of these broad causes would fall into the "nothing but" class: That is, the causes represented by these factors across the 14 studies are nothing but response proclivities, such as social desirability or the habits of yea-sayers and nay-sayers. An alternative possibility, however, is that these two higher-order factors represent constructs that not only account for the correlations of the Big Five but also link this robust descriptive system to various theoretical systems of classical and contemporary personology.

Socialization theories. Factor α, as an abstract, high-level concept that involves the common aspects of Agreeableness (vs. Hostility), Conscientiousness (vs. Heedlessness), and Emotional Stability (vs. Neuroticism) might conceivably suggest a social desirability factor, in the sense of a response set to say socially acceptable things about self or others. On the other hand, it could be viewed as a broad collection of traits that actually are socially desirable. Certainly hostility, neuroticism, and heedlessness are undesirable traits in any society, whereas agreeableness, emotional stability, and conscientiousness have long been the subject of moral lessons.

Another possibility, one that looks upon factors as causal agents, rather than simply a collection of correlated variables, is that Factor α represents the socialization process itself. From Freud (1930) to Kohut (1977), from Watson (1929) to Skinner (1971), personality theorists of various persuasions have been concerned with the development of *impulse restraint* and *conscience,* and the reduction of *hostility, aggression,* and *neurotic*

Table 2
Results of Exploratory Factor Analyses of the 14 Sets of Big Five Correlations

	Digman 1 (1994)		Digman 2 (1994)		Digman 3 (1963c)		Digman & Takemoto-Chock (1981b)		Graziano & Ward (1992)		Yik & Bond (1993)		John et al. 1 (1984)	
Factor	α	β	α	β	α	β	α	β	α	β	α	β	α	β
E	−.22	.77	−.09	.65	−.03	.69	−.15	.82	.16	.71	.18	.78	.16	.73
A	−.81	−.36	.68	−.32	.70	.19	.80	−.17	.72	.16	.79	.28	.72	.10
C	.82	.13	.72	.29	.87	.02	.84	.06	.66	.19	.75	.13	.25	.47
ES	.66	.46	.76	.12	.41	.41	.84	.08	.35	.35	.55	.42	.72	.28
I	.28	.55	.24	.68	.25	.61	.14	.81	.21	.76	.24	.65	.06	.39

Note. E = Extraversion; A = Agreeableness; C = Conscientiousness; ES = Emotional Stability; I = Intellect.

defense. From this point of view, Factor α is what personality development is all about. Thus, if all proceeds according to society's blueprint, the child develops superego and learns to restrain or redirect id impulses and to discharge aggression in socially approved ways. Failure of socialization is indicated by neurosis, by deficient superego, or by excessive aggressiveness.

The interpretation of Factor α as a socialization factor, rather than a social desirability factor, may raise some questions, given recent reports (e.g., Bouchard & McGue, 1990; McCrae & Costa, 1988) that have cast doubt on the importance of shared familial environment and parent–child relations. However, to interpret the dimension as representing the different degrees of success achieved by the socialization process does not necessarily imply that differences in socialized behavior are to be attributed solely to differences in parental rearing practices or other agencies of society; some children, given a particular genetic endowment, prenatal, or early life circumstances, are doubtless more difficult to socialize than are others.

Theories of personal growth. Factor β may be interpreted as another very broad concept in personality theory: Personal growth versus personal constriction. Like the socialization interpretation of Factor α, this concept is extremely broad (indeed so broad that it has sometimes been rather difficult to define) and is related to a perspective on personality very different from those that have come from the psychoanalytic or behaviorist traditions: This is the perspective of personal growth theorists, such as Rogers and Maslow. For Rogers (1961) "the organism has one basic tendency and striving—to actualize, maintain, and enhance the experiencing organism" (p. 487). Similarly, Maslow (1950) suggested ways to achieve personal growth: One should "experience things fully, vividly . . . choose risk . . . make the growth choice" and "use your intelligence" (pp. 11–34). For both of these theorists, personal growth or the actualization of self meant an enlargement of self by a venturesome encounter with life and its attendant risks, by being open to all experience, especially new experience, and by the unfettered use of one's intelligence. In the primary factors of Extraversion and Intellect, as measured in the studies reviewed here, one may find characteristics that reflect these theoretical views, such as outgoing, adventurous, expressive, and active (Extraversion), and creative, imaginative, and open to new ideas and change (Intellect).

Here it should be noted that the Extraversion and Intellect interpretations of these two Big Five factors are debatable: The Big Five Extraversion–Introversion factor is clearly not the classical concept of Jung (1924) or Guilford (1959). Instead, it is Eysenck's (1970) concept, one that has been generally adopted by proponents of the Big Five Model. Extraversion, from this point of view, involves not only an interest in social interaction but also an active, zestful, and venturesome approach to life and to interpersonal relations. An alternative label for this dimension, one offered long ago by Cattell (1933) and more recently by Goldberg (1992b), is *surgency.* Nor should the other primary that helps to define Factor β be confused with the classical concept of general intelligence. Rather, it is a broad domain that is more related to creativity and divergent thinking than to measured intelligence and scholarly activity. Indeed, as McCrae (1992) has proposed, a more meaningful conceptualization of this primary factor may be *Openness to Experience,* a concept that Rogers (1974) would probably have found compatible with his prescriptions for education.

Other theoretical views related to Factors α and β. Although the three principal camps of personality theorists (psychoanalysts, behaviorists, and growth theorists) have based their conjectures on one or the other of these two broad concepts, others, such as Adler (1939), Bakan (1966), Hogan (1982), McAdams (1985), Rank (1945), and Wiggins (1991) appear to have addressed both of these abstractions. Adler might have argued that Factor α represents social interest, and Factor β, superiority striving. Similarly, Bakan has contrasted agency (strivings for mastery, power, self-assertion, and self-expansion) with communion (the urge toward community and the relinquishing of individuality), concepts that were anticipated earlier by Rank's (1945) two "main thrusts" of individuation and union.

More recently, Tellegen (1985) and Tellegen and Waller (in press) in their analyses of the Tellegen Multidimensional Personality Questionnaire (MPQ) have noted three higher-order factors, two of which, Positive Emotionality and Negative Emotionality, may be interpreted as the emotional underpinnings of Factor β and Factor α, respectively (A. Tellegen, personal communication, February 3, 1996), a conclusion reached also by Church (1994). These authors have also noted the agentic aspects of Positive Emotionality and the (reversed) communal aspects of Negative Emotionality. From the point of view of the present study, Negative Emotionality is involved in the negative

John et al. 2 (1984)		Costa & McCrae 1 (1992c)		Costa & McCrae 2 (1992b)		Costa & McCrae 3 (1992b)		Costa, McCrae, & Dye (1991)		Barrick & Mount (1993)		Goldberg (1992a)	
α	β	α	β	α	β	α	β	α	β	α	β	α	β
.27	.56	.17	.69	.25	.47	.23	.62	.18	.66	−.04	.41	.16	.46
.61	.13	.50	.16	.74	.34	.35	−.03	.30	−.12	.49	−.23	.43	−.05
.46	.23	.50	.06	.27	.56	.70	.12	.63	.12	.57	.06	.32	.00
.58	.20	.72	.11	.73	.31	.68	.08	.70	.09	.66	.08	.48	.12
.10	.48	.10	.72	.27	.74	−.09	.58	−.12	.59	.05	.57	−.11	.45

ends of Agreeableness (Hostility) and Emotionality Stability (Neuroticism). In the analyses, a minor but consistent relation may be noticed between Factor β and Conscientiousness, suggesting certain agentic aspects of Conscientiousness, as well.

Hogan (1982), viewing the larger issues in personality theory from a socioanalytic perspective, also suggested two basic human aims—toward status and toward peer popularity. McAdams's (1985) two motives of intimacy and power seem to reflect much of the content of α and β. In an extensive and thoughtful review, Wiggins (1991) considered agency and communion as two basic human motives that have appeared not only in the writings of the authors mentioned here but in the views of other theorists, as well. Table 5 is based on his organization of various conceptual systems in terms of agency and communion.

Recent studies of the structure of social cognition by A. P. Fiske (1991, 1992) and by Haslam and Fiske (1992) have provided a provocative link with these two higher-order factors: A multidimensional analysis of 22 categories of social relationships concluded that the structure of the judged similarity of these categories could be mapped into a three-dimensional space. Dimension 1 of this analysis was indicated by such relationships as intimacy, communality, love, altruism, and cooperation at one end and aggression, exchange, competition, and individualism at the other, a structure that suggests many of the communal aspects of Factor α. A second dimension concerned relationships that imply a sensitivity to the status of the persons involved in the relationship; a third, a distinction between two aspects of such sensitivity, whether the relationship was on the basis of an equal position in the hierarchy or the relationship differed markedly in status. Both of the latter dimensions contain many of the traits associated with Factor β, such as the dominance–submission aspect of extraversion–introversion and the openness–constrained aspect of Intellect.

Table 3
Mean Loadings on Higher Order Factors Across Studies

Factor	Younger participants		Adult participants	
E	−.07	.73	.17	.60
A	.74	−.10	.57	.08
C	.78	.14	.47	.20
ES	.60	.28	.64	.20
I	.22	.68	.07	.57
	Models used for CFAs			
E	—	.73	—	.60
A	.74	—	.57	—
C	.78	—	.47	.20
ES	.60	.28	.64	.20
I	.22	.68	—	.57

Note. E = Extraversion; A = Agreeableness; C = Conscientiousness; ES = Emotional Stability; I = Intellect; CFAs = confirmatory factor analyses. Dash indicates that value was fixed at .00 for Model 1 and was estimated for Model 2.

Factors α and β and Eysenck's P-E-N system. Eysenck (1992) suggested that Factors A (Agreeableness) and C (Conscientiousness) are not "basic" but are probably located at a lower level of abstraction than his basic P (Psychoticism), E (Extraversion), and N (Neuroticism) factors. Eysenck cited as evidence a study by Goldberg and Rosolack (1994) that noted "a disattenuated multiple correlation of 0.85 between P and A/C." Thus, "there can be no doubt about a very strong relationship between these factors" (Eysenck, 1992, p. 867).

The analyses reported here indicate that Eysenck (1992) is correct with respect to a "relationship between these factors," and that they are at a lower level of abstraction than higher-order factors α and β. However, Big Five factors A and C are almost invariably found at the same level as Big Five E and N, which are substantially the E and N factors of Eysenck. The question remaining, then, concerns the appropriate level of Eysenck's P factor. Inspection of the 25 items of the P Scale indicates—at least to this person's eye—that it belongs at the Big Five level. Of the 25 items, 21 have a distinct flavor of either A or C about them: for example, "Do you like other people to be afraid of you? (negative A), and "Do you stop to think things over before doing anything?" (positive C). This view of the apparent nature of many of the P Scale items is supported by a factor analysis of the item correlations of the P Scale by Goldberg and Rosolack (1994): A clear two-factor solution was obtained, and the very high disattenuated correlation noted by Eysenck was based on factor scores derived from these two factors of the P Scale. Rather than implying that this correlation indicates that A and C belong to a lower level of abstraction than E and N, these results could also imply that

Table 4
Results of Confirmatory Factor Analyses

Study	Mean res.	χ^2 (10)	*p*	Fit (CFI)	Mean res.	χ^2 (7)	*p*	Fit (CFI)
	Model 1: younger participants				Model 2: younger participants			
Digman 1 (1994)	.14	60.24	<.001	.972	.09	12.58	.083	.997
Digman 2 (1994)	.15	62.15	<.001	.966	.06	19.78	<.001	.992
Digman 3 (1963c)	.10	119.34	<.001	.984	.10	98.07	<.001	.987
Digman & Takemoto-Chock (1981b)	.18	78.56	<.001	.987	.14	52.79	<.001	.992
Graziano & Ward (1992)	.11	16.31	.091	.992	.06	9.28	.233	.997
M	.14	67.32		.980	.09	38.50		.993
	Model 1: older participants				Model 2: older participants			
Costa & McCrae 1 (1992c)	.10	42.22	<.001	.983	.09	37.45	<.001	.984
Costa & McCrae 2 (1992b)	.25	116.98	<.001	.957	.09	30.67	<.001	.984
Costa & McCrae 3 (1992b)	.10	118.41	<.001	.979	.07	87.47	<.001	.985
Costa, McCrae, & Dye (1991)	.11	28.92	<.001	.984	.09	19.16	.008	.987
John et al. 1 (1984)	.12	21.28	.019	.979	.07	13.63	.058	.988
John et al. 2 (1984)	.11	11.77	.538	.995	.05	6.01	.538	1.000
Barrick & Mount (1993)	.07	6.88	.737	1.000	.05	4.67	.689	1.000
Yik & Bond (1993)	.25	232.08	<.001	.972	.14	145.28	<.001	.983
Goldberg (1992a)	.11	110.20	<.001	.969	.08	68.81	<.001	.981
M	.14	76.53		.980	.07	45.91		.988

Note. Res. = residual; CFI = comparative fit index.

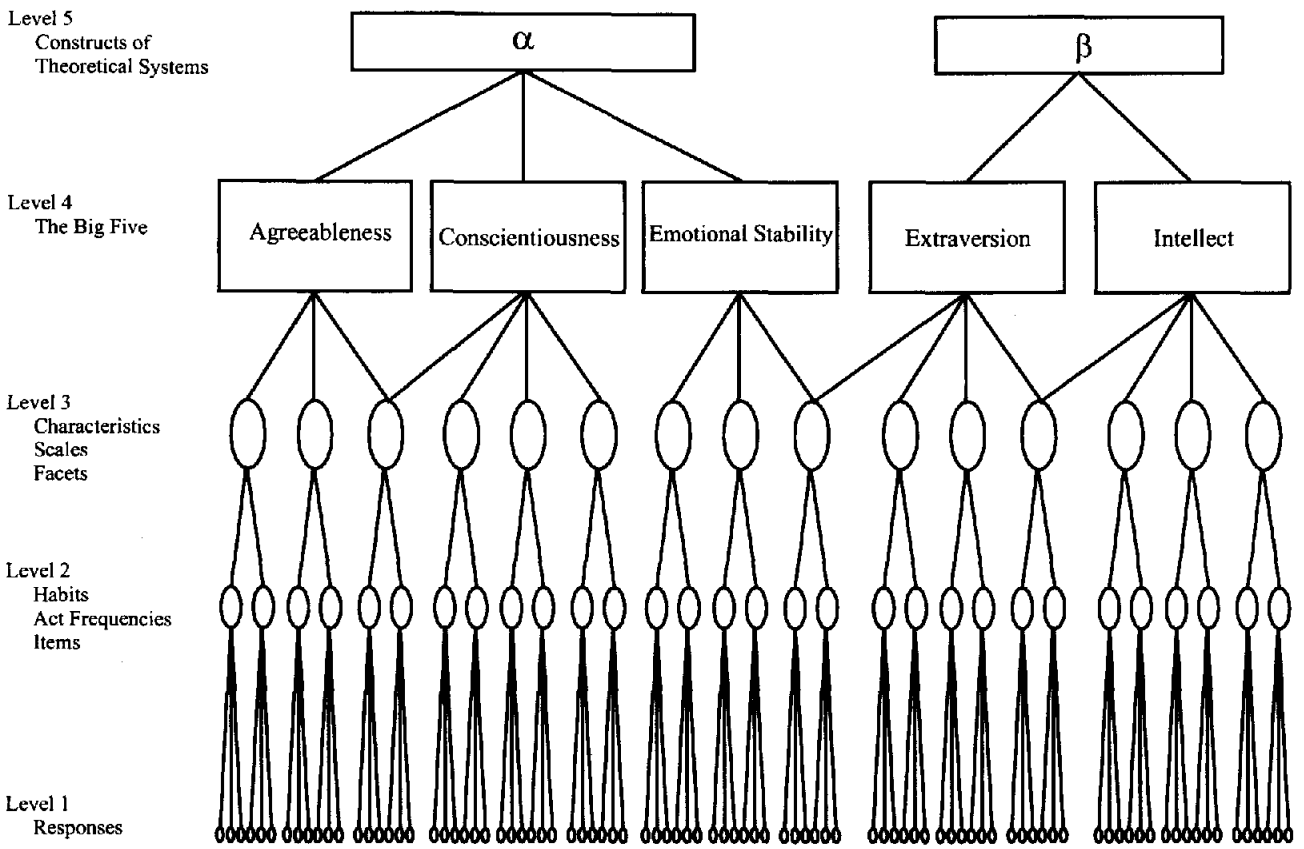

Figure 1. Hierarchy of personality terms from responses to metatraits α and β.

Table 5
Theoretical Conceptions of Several Personality Theorists and Their Apparent Relation to Higher Order Factors α and β

Theorist	α	β
Freud	Psychosexual development	
Adler	Social interest	Superiority striving
Rank	Union	Individuation
Rogers		Personal growth
Maslow		Self-actualization
Bakan	Communion	Agency
Hogan	Maintaining popularity	Achieving status
McAdams	Intimacy motivation	Power motivation
Wiggins	Communion	Agency

Note. These conceptions are modeled after those of Wiggins (1991). Cells that are empty indicate less attention on the part of the theorist.

the P factor, at least as measured by the 25-item P Scale, is principally A and C—and, hence, on the level of other Big Five factors.

Implications of the Present Studies for the Validity of the Five-Factor Model

A very wrong and quite misinformed conclusion would be that the many studies that have led to the current interest in the five-factor model (e.g., Costa & McCrae, 1985, 1992c; Goldberg, 1992b, 1993b), most of which have been accomplished by the use of principal components analysis accompanied by orthogonal rotation, are now properly suspect. As anyone conversant with factor-analytic methodology knows, the differences between orthogonal and oblique solutions are typically minor, so far as interpretation is concerned, particularly when the data exhibit substantial correlations between pairs of variables, as in the case of personality measures, and the number of variables is large (e.g., over 50). Indeed, two of the studies leading to the revived interest in the Big Five model (e.g., Digman & Inouye, 1986; Digman & Takemoto-Chock, 1981a) employed the common-factor model and oblique rotation. In a study focused on possible differences in results, depending on method of analysis, Goldberg (1990), whose solutions generally have employed the principal components method with varimax rotation, analyzed several data sets by various methods, including common-factor analysis with oblique rotation and principal components with orthogonal rotation, obtaining solutions from both methods that were indistinguishable, so far as interpretation was concerned, although the loadings from the common-factor approach were predictably—and mildly—reduced, as compared with the principal components analyses. However, regardless of method of analysis, the same five factors emerged, with clearly the same content.

At the level of primary factors, the choice of analytic method, then, is partly a matter of taste, partly a matter of one's purpose. Regardless of choice, the same organizing dimensions underlying the data will almost always emerge. Of course, if one's interest is directed toward the relations among the factors, however obtained, some procedure other than an orthogonal technique will be necessary.

In conclusion, analyses of correlations of the Big Five, obtained from child, adolescent, and adult samples, imply the presence of two higher-order factors. These constructs furnish links between the atheoretical Big Five model and traditional and contemporary theories of personality, which, under a variety of interpretations, have dealt with one or the other—or both—of these high-level factors.

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Appendix A

Characteristics of the 14 Studies

Study	*N*	Participants	Observation type
Digman 1 (1994)	102	Children	Teacher ratings
Digman 2 (1994)	149	Children	Teacher ratings
Digman 3 (1963c)	334	Children	Teacher ratings
Digman & Takemoto-Chock (1981b)	162	Children	Teacher ratings
Graziano & Ward (1992)	91	Adolescents	Teacher ratings
Yik & Bond (1993)	656	Young adults	Self ratings
John et al. 1 (1984)	70	Young adults	Self ratings
John et al. 2 (1984)	70	Young adults	Self ratings
Costa & McCrae 1 (1992c)	277	Mature adults	Inventory (peers)
Costa & McCrae 2 (1992b)	227	Mature adults	Peer ratings
Costa & McCrae 3 (1992b)	1,000	Mature adults	Inventory (self)
Costa, McCrae, & Dye (1991)	227	Mature adults	Inventory (self)
Barrick & Mount (1993)	91	Mature adults	Inventory (self)
Goldberg (1992a)	1,040	Mature adults	Self ratings

(*Appendixes continue*)

Appendix B

Factor Correlations

	Digman 1 (1994)				Digman 2 (1994)				Digman 3 (1963c)				Digman & Takemoto-Chock (1981b)			
Factor	1	2	3	4	1	2	3	4	1	2	3	4	I	2	3	4
1. E	—				—				—				—			
2. A	−.48	—			−.30	—			.25	—			−.26	—		
3. C	−.10	.62	—		.07	.39	—		−.10	.65	—		−.16	.65	—	
4. ES	.27	.41	.59	—	.09	.53	.59	—	.24	.35	.37	—	.01	.70	.71	—
5. I	.37	.00	.35	.41	.45	−.05	.44	.22	.41	.14	.33	.41	.66	−.03	.24	.11

	Graziano & Ward (1992)				Yik & Bond (1993)				John et al. 1 (1984)				John et al. 2 (1984)			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. E	—				—				—				—			
2. A	.29	—			.35	—			.13	—			.16	—		
3. C	.16	.64	—		.20	.66	—		.43	.25	—		.26	.36	—	
4. ES	.32	.35	.27	—	.49	.57	.45	—	.37	.59	.28	—	.36	.41	.26	—
5. I	.53	.22	.22	.36	.59	.38	.31	.31	.35	.15	.12	.10	.33	.19	.16	.07

	Costa & McCrae 1 (1992c)				Costa & McCrae 2 (1992b)				Costa & McCrae 3 (1992b)				Costa, McCrae, & Dye (1991)			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. E	—				—				—				—			
2. A	.11	—			.42	—			.04	—			−.07	—		
3. C	.19	.18	—		.25	.34	—		.27	.24	—		.22	.13	—	
4. ES	.22	.44	.42	—	.26	.69	.43	—	.21	.25	.53	—	.21	.25	.49	—
5. I	.56	.24	.05	.12	.46	.44	.54	.42	.40	−.02	−.02	−.02	.43	−.06	−.04	−.05

	Barrick & Mount (1993)				Goldberg (1992a)			
	1	2	3	4	1	2	3	4
1. E	—				—			
2. A	−.04	—			.06	—		
3. C	−.03	.25	—		.04	.13	—	
4. ES	−.03	.34	.41	—	.16	.23	.17	—
5. I	.28	−.17	.08	.12	.24	−.09	−.03	−.01

Note. E = Extraversion; A = Agreeableness; C = Conscientiousness; ES = Emotional Stability; I = Intellect.

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