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## TARGET ARTICLE

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### The Five-Factor Framing of Personality and Beyond: Some Ruminations

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*The five-factor conceptualization of personality has been presented as all-embracing in understanding personality and has even received authoritative recommendation for understanding early development. I raise various concerns regarding this popular model. More specifically, (a) the atheoretical nature of the five-factors, their cloudy measurement, and their inappropriateness for studying early childhood are discussed; (b) the method (and morass) of factor analysis as the exclusive paradigm for conceptualizing personality is questioned and the continuing nonconsensual understandings of the five-factors is noted; (c) various unrecognized but successful efforts to specify aspects of character not subsumed by the catholic five-factors are brought forward; and (d) transformational developments in regard to inventory assessment of personality are mentioned. I conclude by suggesting that repeatedly observed higher order factors hierarchically above the proclaimed five may promise deeper biological understanding of the origins and implications of these superfactors.*

*Key words: personality, five-factor model, neuroticism, extraversion, openness, agreeableness, conscientiousness.*

#### Introduction and Perspective

I have been a long, active participant in and an attentive—even obsessive—observer of the scientific study of personality including its early development, its conceptual and empirical ups and downs, its fads and fashions. In this perambulating and idiosyncratic article, I attempt to touch primarily upon the last three decades or so, expressing some personal recognitions and concerns regarding this thorny field as we go forward further into the 21st century.

Since the 1980s, the study of human personality has been largely, vigorously, and grandly centered on *delimited and foreclosed stated responses by lay adult participants to brief person-descriptive words or phrases*—the lexical Big Five (BF) collection of adjectives initially organized and promulgated largely by Goldberg (1981, 1990, 1993) and the later developed, derivative variant, the Five-Factor-Model (FFM) questionnaire approach to personality study advocated by Costa and McCrae (1992). Various additional versions of the lexical BF and of the FFM have appeared over the years.

In important ways, the original BF and the FFM are necessarily substantively similar, but in other ways

they were crucially different in their methodology, further development, and aspiration. The initial BF was strictly phenotypic, empirically organizing the usage of single-word common-language personality descriptors via the method of factor analysis into five factors (neutrally identified by the Roman numerals, I through V). The FFM has been far more ambitious, being explicitly hierarchical in its two-level structure of factors and facets, and named its five primary factors as Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness.<sup>1</sup> In what follows, when I refer conjointly to these two related approaches, I collectively refer to the BF and FFM as the Five-Factor-Approach (FFA). I think it is fair to say that, thus far, the FFM initiated by Costa and McCrae has achieved wider literature and applications prominence than Goldberg's BF.

Historically, the BF emerged as a consequence of

“one critical assumption. Those individual differences that are most significant in the daily transactions of

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<sup>1</sup>These factors have often been simply identified by their initial-letter designations (N, E, O, A, C), mnemonically remembered more easily as CANOE or OCEAN.

persons with each other will eventually become encoded in their language . . . . A major objective . . . is to develop a theoretically compelling structure, or taxonomy, for all personality-descriptive terms in English. . . ." (Goldberg, 1982, p. 204)

This motivating conjecture about everyday lay languages generated a number of studies involving various samples of adjectives, subjects, and languages, then evaluated with respect to the empirical usage of single-word, adjective person-descriptors. These usage correlations among the adjectives, when subjected to the statistical method of factor analysis, repeatedly were reported as issuing five adjective cluster-dimensions and were interpreted as supporting "the Lexical Hypothesis."<sup>2</sup> The BF dimensions emerging were labeled (I) Surgency (or Extraversion), (II) Agreeableness, (III) Conscientiousness (or Dependability), (IV) Emotional Stability (vs. Neuroticism), and (V) Intellect. For many BF advocates, the five clusters seemed intuitively apt, perhaps even evolutionarily germane, and therefore the obtained factor structure was deemed universally sufficient for use in describing persons in general.

Separately, and quite independent of the BF, Costa and McCrae (1985) had developed their own, acronically named three-factor NEO Personality Inventory, limited to measuring their particular scale versions of Neuroticism and Extraversion—both constructs already well evaluated by a number of previous questionnaire scales—and a relatively unusual scale evaluating what they called Openness to Experience.<sup>3</sup> The questionnaire person-queries defining each of these three factor scales (which they characterized as representing "domains") were each further subdivided thoughtfully but subjectively into exactly six "facets"—short, eight-sentence-long subscales of "person discriminants," each subscale posited as representing an important feature of each factor domain. The Costa and McCrae decisions reached in "faceting" their three initial NEO personality scales from "person-discriminants" remain essentially unchanged after three decades of usage and research.

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<sup>2</sup>However, it is often unrecognized or unacknowledged that the lexical hypothesis is not the only basis for its subsequent findings and the five-factor model. The nature of the algorithm of factor analysis is that it will reveal lexical factor dimensions if and only if those dimensions have many synonyms or near-synonyms among the trait terms being studied. Person qualities that are important but not abundantly referenced as adjectives in the common language (e.g., "effeminate" or "mannish"), were they to be included in the factor analysis, would tend to be missed by the factor analysis process. It is not always the case that the number of synonyms for a word testifies to the psychological importance of that word. Certain words—crucial words—do not need to be redundantly expressed.

<sup>3</sup>Cattell (1970), Coan (1972), and Tellegen (1974), among others, had earlier ventured into this psychological domain.

Subsequently, impressed by the increasingly influential lexical five-factor analyses of Goldberg's person-descriptors, Costa and McCrae saw larger possibilities in developing a questionnaire version of the adjectival five-factors. They considered the inventory format of short sentences as having wider usage potential by the wide variety of psychologist-evaluators than single-word, person-adjective descriptors. Further, and crucially, they interpreted their three pre-existing NEO questionnaire scales as substantively equivalent, psychologically, to three of Goldberg's adjective factor dimensions—Goldberg's Emotional Stability adjective factor, if reflected, they viewed as equivalent to their NEO Neuroticism factor, Goldberg's Surgency adjective factor they interpreted as tantamount to their NEO Extraversion factor, and Goldberg's Intellect adjective factor they claimed, arguably, could be construed as rather similar to their NEO Openness to Experience factor.<sup>4</sup> But their initial three-dimensional NEO inventory lacked questionnaire versions of two of the five Goldberg person-adjective factors. They therefore constructed questionnaires for their own versions of inventory scales labeled *Conscientiousness* and *Agreeableness* and "grafted" (Goldberg, 1993, p. 31) these two new "domains," that is, scales, onto what they now called the NEO-PI (Costa & McCrae, 1985). These latter two factor-representing scales, each subsequently further subdivided as before by dyadic decision into six eight-item facet scales, in keeping with their previously established scheme, became part of what was revisionally named the NEO-PI-R (Costa & McCrae, 1992).

These person-measures—the initial BF and the later-evolved FFM—are based on aggregations of adjectives or inventory-sentences responded to by the studied lay persons as descriptive of their selves or of others with whom they have some acquaintance. Subsequent factor analyses of these person-descriptors, variously formulated and expressed in a variety of languages, have repeatedly reported the finding of five largely similar factors. The reporting of this replicated finding has been interpreted as attesting to the universality of a common, conceptually sufficient, *orthogonal* structure underlying person variation. The emergence of this consensus, enthusiastically and internationally embraced in the last 30 years, has been viewed as a signal, fruitful, scientific achievement: the finding of *the* five basic factors underlying the human personality. Why are there five factors? It was claimed by some as "an empirical fact, like the fact that there are seven continents on earth and eight American Presidents from Virginia" (McCrae & John, 1992, p. 194).

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<sup>4</sup>It is not without interest that, a few years later, McCrae argued—I think correctly—that Openness was insufficiently represented by single word descriptors as in Goldberg's BF.

A quick and doubtless incomplete Google search reveals thousands of “five personality factor” articles in refereed journals (about 600 in the last 2 years). Although many are of peripheral interest and some may even be strange, conveying unexplained, and unreplicated connections between the FFA and available other data (e.g., Guadagno, Okdie, & Eno, 2008, on blogging prediction; Tate & Shelton, 2008, on tattooing and body piercing; Vermaes, Janssens, Mullaart, Vinck, & Gerris, 2008, on spina bifida), any student of the personality literature must acknowledge the prevailing temper of these times: The FFA, variously predicted, has become central to contemporary personality research.

I note that I am on record from years ago as a “contrarian” with regard to then accepting the questionnaire- or descriptor-based five-factor approach to portraying personality structure as a fundamental advance in the understanding of human personality (Block, 1995a, 1995b, 2001). I am vain enough to suggest that present readers may find these earlier background articles informative, perspectivizing, and of continuing current interest. Then, although I by no means questioned the substantial usefulness of questionnaires or descriptor-clusters, which I myself have frequently used to advantage (e.g., Block, 1965), I particularly noted a variety of problems I saw plaguing the lay-response focused FFA as the sole and sufficient basis for comprehensively conceptualizing the complex terrain of personality.

Herein, I somewhat repeat but also further extend concerns regarding the FFA as the personality rubric for our time. I also acknowledge that there may be a deep underlying genetic basis to the empirical regularity of the findings accruing to “the five-factors”; however, I continue to appreciably disagree with or find insufficient the psychological understandings usually emanating from this approach.

I recognize that I may be perceived by some as having a penchant for disagreeing with fellow psychologists (Block, 1995a); however, I suggest—equally—that others may have an equivalent penchant for disagreeing with disagreement. Understandably, even in science, there often can be an overeagerness and projectivity in pressing one’s viewpoint, even a latent procrusteanism or lacunae in the interpretation of logic and realities. I frankly own up to such susceptibilities and hope that, in what follows, I have sufficiently tethered them.

## The FFA and Developmental Psychology

The remarkable spread, reach, and sway of the FFA may be exemplified—by no means exclusively—by the recent, important chapter in the *Handbook of*

*Child Psychology*, titled “Personality Development” (Caspi & Shiner, 2006). Handbook chapters in well-established psychological fields tend to be highly influential, defining scope and providing ready access to au courant knowledge. Novitiates receive a rapid and helpful introduction in the conceptual and empirical domain; toilers in the field easily can update themselves. But, nevertheless, very much depends on the perspective or framing of the chapter. Topically equivalent accounts by different authors or at different times can sing very different tunes, in regard to both content and standards of coverage.

Although this particular chapter in a prescriptive volume is a lucid, well-organized, contemporizing account of the place of temperament within developmental psychology. I was surprised by the FFA theoretical perspective advocated therein with respect to developmental psychology. In my view, the conceptual orientation presented illustrates the far—and as yet empirically unwarranted—reaches of the adult-oriented FFA into the role of temperament within child development.

At its outset and thereafter, Caspi and Shiner (2006) seem to have prestructured developmental issues of emergent temperament in terms of the FFM perspective as brought forward by factor-analysis-oriented personologists (e.g., Goldberg, 1990; John & Srivastava, 1999; McCrae & Costa, 1999). They suggest that developmentalists “now have greater clarity about the adult personality traits that child studies should be trying to predict over time” (p. 307).

However, as usually operationalized via a questionnaire for lay adults, the FFM cannot be readily interpreted or analogized to apply to the behavior and verbal comprehension of individuals less than midadolescent, that is, infancy, toddlers, young, and middle children. To support their suggestion for considering the FFA as intimated in the earlier years, Caspi and Shiner focus on one study, the statistical reprocessing (Measelle, John, Ablow, Cowan, & Cowan, 2005) of a previously reported puppet-based interview of a sample of children aged 5 to 7 (Measelle, Ablow, Cowan, & Cowan, 1998). In their Table 6.1, Caspi and Shiner display selected puppet-interview responses of these children as corresponding in their organization to the adult-oriented five-factor structure. Thus, a child’s puppet response, “If someone is mean to me, I don’t hit them,” is said to augur the adult factor Agreeableness; a child’s projected puppet response, “I’m a smart kid,” is claimed to intimate later adult Openness to Experience; the puppet response, “I get nervous when my teacher calls on me,” is anticipated to be predictive of adult-based Neuroticism. Other psychologists may wish to await independent replication of this secondary analysis and—more important—the demonstration of a variety of concordant studies before importantly relying upon the grand

suggestion of a downward applicability to young children of the FFM. This downward age generalization of the FFA should not rest only upon so fragile a one-time postinterpretation.

In the meanwhile, the question of the structure of young children's person-attributions is perhaps indicated by an earlier study (Peevers & Secord, 1973) on age developmental changes in person descriptions. They found that children in kindergarten or the first grade do not characteristically invoke dispositional labels along the lines of the FFM. The claimed generalization of the FFM to the earlier wordings employed by young children in a puppet interview awaits further and independent empirical demonstration.

In proposing that the FFA applies to the early developmental years, this view accepts that five nominally orthogonal trait constructs emanating from factor analyses of quickly-responded-to self- or other-person questionnaires by lay adults provide a cogent, sufficient, organizing framework for understanding personality and the long, prior years of human development.

I suggest, alternatively, this way of framing developmental issues of temperament from infancy on in terms of the personality trait categories stemming from the questionnaire responses of opportunely available lay adults is premature and unresponsive to other developmental research. Certainly, the five-factor trait viewpoint is currently *popularly* employed. But popularity has never been a scientific criterion of veracity. The lay *adult-based*, asserted as orthogonal, five-factor structure did not derive in any way from achieved understandings in developmental psychology. Rather, although the FFA orientation in its own terms—when closely considered—remains semantically murky and contentious, it is offered in this handbook chapter on in-born temperament as *the* generative conceptual scheme for *retrospectively* considering the complexities of human development from the very early years. I submit that the nature of the neonate, the life-enveloping infant, the developing child, the emerging adolescent, the subsequent prime years of the adult, and even the octogenarian—progressively and often fundamentally changing over time and context—is not especially illuminated by a framing emerging from orthogonalizing factor analyses of the responses offered by often-unrepresentative adult samples to quick inventories of convenience. To currently make a probative case for the prematurity of settling upon *the* “five factors” of adult personality as a coherent and advancing structure for reflecting backward in time upon personality development, it is necessary to indicate how this five-factor structuring “rooted” (McCrae & Costa, 1989, p. 108) in the mechanics of factor analysis is deficient and perhaps even stultifying in generating understanding of core temperament and dynamically evolved personality.

## Why the FFA Does Not Help Understanding

### The FFA Is Atheoretical<sup>5</sup>

The term “theory” means very different things to different people. Sometimes, the term “theory” is used informally by psychologists to describe a hunch that research in a particular area will prove fruitful or that certain distinctions among variables are worth making. Sometimes a relation between two variables is proposed as a “theory.” More rigorously, however, it would be scientifically superior to define a model of personality as a *system* within the individual of dynamically interconnected, interdependent variables organized over time to have adaptive systemic effect. A proper model is more than a simple listing of personality variables or domains asserted to be sufficient; it should be an integrative model of organized personality *functioning*. Given these prefatory remarks, the FFA can be recognized as descriptive only, statically so rather than a dynamic model.

### The FFA Ignores Contemporary Evolutionary Thinking

Goldberg's (1981) common-sense suggestion as to how the five trait descriptive categories lexically emerged over ancestral time because of their crucial utility in evaluating inevitable social contexts is certainly suggestive as a loosely grounded evolutionary conjecture. But it was never seriously intended and grounded in evolutionary terms. As Hubbard (1995) remarked,

Development is dialectical and not linear. What happens to a person all along the way, and what that person makes happen, will continuously affect her or his biological, psychological and social growth and development. We are not simply . . . readouts of our genes. (p. 8)<sup>6</sup>

It is about time we recognized that heredity and environment are not simply additively related; their connection is complex and nonlinear, often synergistic.

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<sup>5</sup>The FFA view is quite explicit: “Description of personality must precede, not follow, personality theory” (Costa & McCrae, 1992, p. 861). But compare with “Science walks forward on two feet, namely theory and experiment. . . . Sometimes it is one foot which is put forward first, sometimes the other, but continuous progress is only made by the use of both” (Millikan, 1923/1965, p. 54).

<sup>6</sup>Although Caspi and Shiner have offered a sophisticated discussion of the complicated field of molecular genetics, they acknowledge that this research area as yet offers little that is dependably replicable to developmental knowledge and remains most difficult. In particular, they note that, “for behavioral prediction, it is often a short-sighted strategy to rely exclusively on measures of broad superfactors (i.e. the FFA) . . . such exclusive reliance may limit research into the genetic etiology of personality differences” (Caspi & Shiner, 2006, p. 332).

The recent emergence of “evo-devo”<sup>7</sup> and epigenesis have great potential for understanding these nonlinear developments but are scientific fields “untouchable” by rapidly emitted lay response to the FFA.

### The FFA Has No Serious Ontogenetic Implications

Beyond question, an absolute tenet of the study of human development is that lives through time are involved. The static FFA, quite unaided by unique theoretical principles or guidance, generates repetitive, unsurprising (and, in a sense, tautological) slight, nonchance findings within large samples. It provides no empirical expectations regarding an infant’s developmental course or its adaptive strengths or susceptibilities before becoming a literate late adolescent.

#### Some Inadequacies of the FFA

##### Mathematical Orthogonality Is Unrelated to Psychological Understanding

Effectively, the FFA considers and evaluates its five dimensions as *orthogonal*. Many users of the FFA do not consider the implications of its assumption or creation of orthogonality. To exemplify, in three-dimensional evaluation of the space of a room, a layperson will know that the length of a room entails nothing necessarily about its width or its ceiling height—length, width, and height are *conceptually, logically* unrelated, although they may well be, and often are, *functionally* related. Treated only as a set of orthogonal dimensions, each dimension operates singly, separately, as unrelated to the others—rather than conjointly or configurationally.

However, in fact, for each of the five FFA dimensions, the other four factors indubitably influence the special ways the particular, focused-upon dimension is expressed; that is, by virtue of controlling or not controlling *any* one of the FFA factors, the correlates of another factor will vary. It is the complex *interplay* of the various personality dimensions or aspects of character (conjoined with the situational context) that truly expresses the nature of an individual. In the FFA research world, however, each of the five factors is usually evaluated *singly* rather than as moderated by another or others of the five factors. The plethora of low, even if statistically “significant,” relationships, often correlationally observed for a factor domain when scanning large samples, is at a far remove from understanding

the complexly interactive system characterizing an individual’s personality.

### The Use of Factor Analysis as *the* Person Paradigm

The FFA is based on, and embraces, the mathematical model of factor analysis as a sufficient method for recognizing and establishing a suitable taxonomy of adult human character. There remain psychological reasons to be uneasy with this union.

The FFA is pushed by prior substantive preference rather than pulled by pure mathematical truths. (As experienced factor analysts will acknowledge, there are differences among them with respect to stopping rules, rotational preferences, and other witting or unwitting manipulation of data.) Although the FFA has been presented as if *the* five obtained factors are orthogonal and are each of equivalent behavioral importance, in fact the orthogonality is deliberately created rather than empirically existent and the first two or three trait factors in the five-factor-structure are, empirically, appreciably more clear and consequential than the remaining three or two.

Loevinger (1993) called attention to the psychologically untenable assumption within factor analysis of mathematical rectilinearity, of linearity in general with regard to understanding humans. For epistemological reasons, Meehl (1992) has cautioned that “No statistical procedure should be treated as a mechanical truth generator” (p. 152). In particular, the factor analytic method can generate a variety of “truths,” according to the bent or desires or avoidances of the particular factor analyst. Although the method of factor analysis can be extraordinarily illuminating, by itself the method *alone* should not be empowered to make paramount and controlling decisions regarding the concepts to be used within the field of personality. Factor analysis results may certainly offer or confirm suggestions, but these should be based on conceptual and epistemic considerations.

In actuality, the diverse individuals employing factor analysis are not passive recipients of what their favored algorithm happens to issue. At various points during the factor analytic process, analysts have an opportunity to sluice their results in preferred directions—to have more or fewer factors, orthogonalized or correlated factors, to fit a preferred or previous conceptual scheme or to be subject to the uncontrolled, happenstance lay of the data. For these reasons, among others, we should bolster our particular factoring results in complementary, quite separate, and non-factor-analytic ways, seeking a variety of phenotypically diverse but theoretically convergent psychological resources and methodologies involving close conceptualizing, perceptive observation, and unconfounding, clarifying, incisive

<sup>7</sup>The short-hand phrase for *evolutionary developmental biology*: the study of how the dynamics of development may determine phenotypic variation arising from genetic variation and how that may subsequently affect the direction of phenotypic evolution (Ploeger, van der Maas, & Raaijmakers, 2008a, 2008b).

empiricism (Block & Block, 1980). Within the scientific tradition, nomological recognitions should emerge; personal preferences or aspirations should not alone shape a field.

### **The Scaling Paradigm Underlying the FFA is Importantly Ill-Suited for a Larger Psychological Understanding**

The measurement logic used in the FFA approach for constructing scales of measurement, although conventional and popular, does not reflect crucial developmental, phase-transition changes and may be misleading or obscuring of the developmental meaning of FFA scores.

Years ago, Loevinger (1948, 1957, 1993) concerned with “objective tests as instruments of psychological theory,” recognized a psychologically strategic distinction between what she called *cumulative* and *differential* scale measurement in creating psychological test measures.

In the cumulative (or monotone) measurement model conventionally used, the more keyed answers of the respondent to the putative trait, the higher the individual’s score on that trait and the more of that trait the person is assumed to intrinsically possess. Each of the five primary FFA scales is evaluated via the principle of cumulative scale measurement.

However, a differential model (also known as a non-monotonic scale; Coombs, 1953) places an individual’s low, mid-range, or high score along an arcing, curvilinear person dimension, with different positions on the dimension having quite different psychological implications.

A cumulatively treated scale of the FFA provides a numerical score on its dimension but not a context of psychological meaning or implication—a frame of reference—for that score. Conceptually, however, differential measurement is often necessary for conveying the psychological implications or the “fitness” consequent upon an individual’s place along the arc of a FFA dimension.

Thus, for example, does an individual’s particular Conscientiousness score on the NEO-PI-R imply *excessive* conscientiousness (such as extreme conformity, capitulation to apparent consensus, being “plodding,” “routinized,” “overly-diligent,” “obsessive,” etc.) or does it imply *insufficient* conscientiousness (being “undependable,” “careless,” “inattentive,” “breaking of rules,” etc.), or imply an *intermediate* conscientiousness level (being “persistent,” “organized,” “self-disciplined,” “self-controlled,” etc.), that is considered normative, appropriate, and situationally adaptive?

These distinctions are of consequence but are unrecognized and unspecified by conventional cumulative scale analysis. We need to have norms or psy-

chological theory to have a clarifying perspective on the meaning of scale scores. In studying human development, a differential strategy is able to specify an individual’s particular stage or place within the series of life-transforming changes or life-phase transitions undergone in the arc of one’s personality-structural development (such as, e.g., establishing a self-referent rather than an other-referent conception of morality or in developing a personal “theory of mind” or in recognizing the possibilities and limitations inherent in one’s age).

With respect to the FFA, in addition to the problem of achieving perspective on the psychological meaning of a score on the FFA Conscientiousness factor, the remaining four FFA scales—when closely reconsidered—can also be recognized as warranting usage of differential rather than cumulative scoring, as more informative when interpreted within a conceptual or empirical norming perspective.

For each of the remaining four FFA factor dimensions, comparing scorers at either end of the continuum (*extreme* Extraversion, such as unbridled hyperactivity vs. *insufficient* Extraversion, such as extreme interiority; *extreme* Neuroticism, such as hyperadverse reactivity to the quotidian day vs. *insufficient* Neuroticism, such as an extreme unreactivity to the tenor and fluctuations of daily existence; *extreme* Agreeableness, such as self-ignoring vs. *insufficient* Agreeableness, such as irascibility; and *extreme* Openness, such as extreme capitulation to the fleeting vagaries of thought and perception vs. *insufficient* Openness, such as trameled thought) will certainly deliver findings of substantive interest. But this simple, High-Low approach to analysis is oblivious to what it fails to reveal. When referenced against modal-or median-like or conceptually, societally defined placements on each of the five trait dimensions, the differential measurement approach may reveal the existence of psychologically crucial, nonlinear relationships—findings undetectable and unrecognizable via the use of cumulative scoring and simplistic correlational analysis.

For example, from long ago (Block & Thomas, 1955), a measure of self-esteem, when evaluated cumulatively, displays many personality differences between individuals at one extreme versus the other extreme of the self-esteem dimension. An individual with a very high level of self-esteem leads a more self-satisfying life than one with a very low level of self-esteem. However, when evaluated according to a differential model, individuals with an appreciable self-esteem but also cognizant of certain personal imperfections prove to have personality qualities different from and psychologically more favorable than those of individuals describing themselves as absolutely without any personal flaws or faults. Extreme, unqualified self-esteem seems to reflect a narcissism and lack of self-reflection rather than an achieved perfection.



Similarly, men with unwarranted confidence are importantly different from men with unwarranted uncertainty (a High/Low contrast), but both groups are each interestingly different from men with confidence attuned to the probabilistic realities of their external situation (Block & Petersen, 1955).

Another example: In the present cultural epoch, late adolescents who are heavily into the drug scene are psychologically less internally and externally adaptive than late adolescents totally abstaining from drugs. But total abstainers from drugs in the mid-1980s were psychologically less socially adaptive than adolescents who have experimented somewhat with drugs (Shedler & Block, 1990).

As a last illustration of the value of differential analysis, comparing highly impulsive, relatively uncontrolled individuals with highly restrained, relatively overcontrolled individuals reveals many cogent personality differences but fails to reveal the person-qualities characterizing resilient individuals, that is, individuals averaging intermediate, situationally more adaptive places along this impulsivity-constraint dimension (e.g., Block & Block, 1980).

Although psychologically still too infrequently applied, a differential rather than a cumulative approach to personality measurement can provide crucial understandings not available by simple correlations or high–low comparisons. It also bespeaks provocatively to evolutionary psychology in suggesting how heritable person variation has been maintained as a function of the “fitness” disadvantages accruing to individuals at *either* extreme of a significant personality dimension (Macdonald, 1995; Nettle, 2006).

### FFA Equivocality in Describing the Person

Because of their research convenience and substantial usefulness, printed questionnaires or adjective word lists administered to lay individuals have a long, long history in personality psychology. There are at least two problems besetting the use of such questionnaires and word lists—one regarding the commonality of language discriminations among the laity and a second regarding the conceptual “naming” language employed by academic personologists attempting a relevant and apt nomenclature. There is also the separate issue of the psychological authenticity of the statements offered by the laypeople providing the data.

### “Fuzziness” Among Laypersons in Their Usage of Person-Descriptive Words

The FFA is usually operationally realized through investigator-convenient administration of questionnaires or word lists impersonally offered as understandable by conveniently accessible or captive participants. Participants respond via quickly indicating their place-

ment with respect to a variety of what Meehl called “surface traits” (“correlated response families”) and sometimes the “surface traits” of others. In the initial sample on which the FFM is based, the participants tended to be relatively intelligent and of remarkably high education.<sup>8</sup> Subsequently, the FFA was predominantly based on select, laypeople opportunely available or specially motivated and/or lured—college students or college proximate individuals whom Henrich, Heine, and Norenzayan (in press) called “weird” people: Participants from societies relatively Western, relatively *Educated*, relatively *Industrialized*, relatively *Rich*, and relatively *Democratized*. Samples of relatively uneducated, unskilled, culturally different, “submerged” individuals have rarely been studied.

A central assumption of the FFA is that the use of everyday personality language can be used for scientific purposes. Hofstee (1990) thoughtfully contemplated this conjecture and concluded that “the natural language of personality is difficult to define, to a great extent parochial, oversaturated with evaluative considerations, unruly with respect to its internal structure” (p. 850). Elsewhere, he further remarked, “The overwhelming impression that arises from processing empirical [language] data . . . is that substantive results are fuzzy. Hardly any two persons using the same trait adjectives seem to mean precisely the same thing” (Hofstee, de Raad, & Goldberg, 1992, p. 162). Goldberg and Kilkowski (1985) also commented on the appreciable differences among respondents in their word understandings of common terms. To the extent adjectives are indeed “fuzzily” interpreted, the obscuring fuzziness also obviously applies to adjectival phrases or the longer statements in questionnaires.

### Continuing Personologist Differences in Interpretation of the Five Factors

The FFA represents an interspersing of questionnaire items or person-adjectives that can be personologist-organized into five orthogonal (unrelated) trait scales deemed crucial and presumed to be factorially sufficient. However, there prove to be large differences among psychologists in their understandings of these five scale domains when they are elaborated as to their fuller psychological meanings. This is not surprising; as Meehl (1998) earlier despairingly noted, construct namings are usually problematic because they lack consensuality. The five named FFA domains, per se, have—without close consideration to resolve different construals—been largely presumed to be equivalently understood by all psychologists

<sup>8</sup>In the original Baltimore Longitudinal Study of Aging, which Costa and McCrae first used to begin their questionnaire construction, 25% of their participants held Ph.D.s

although often operationalized via a variety of FFA versions and language translations.

Even granting the current FFA, perplexities or questions or arguments remain with regard to the interpretation of each of its offered five trait categories and the trait assignment of various facets. From one of the representations of the FFA to another, the psychological “flavorings” of the five factors can differ substantially. Given these different connotative interpretations, the lay, societally evaluative namings of the five factors might have been better identified in more abstract, technical terms as in the Roman numerals used in the original BF.

**Extraversion** (initially called *Surgency* by Goldberg). Historically, this factor has also been labeled as *assertiveness*, *power*, *activity*, *positive emotionality*, and *interpersonal involvement* (Carroll, 2002, p. 103). Roberts, Walton, & Viechtbauer, (2006) found it crucial to bifurcate Extraversion into the dimensions of *social vitality* and *social dominance*. Does this factor imply *sociability* as averred (Guilford, 1977) or *impulsivity* (Eysenck, 1977) or a varying mixture of the two? Is the facet, *impulsivity*, better included within this FFA broad factor, as Goldberg preferred, or better located within the *Neuroticism* factor, as fixed in the facets of Costa and McCrae? Thus, there continues to be confusion and contestation regarding various construals of this factor. Different psychologists project importantly differing views of this fundamental domain. The dictionary does not especially help: It is defined by the *Merriam-Webster Collegiate Dictionary* (2003) as “the act, state, or habit of being predominantly concerned with and obtaining gratification from what is outside the self.” I submit that the word *extraversion*, although by now having developed broad colloquial usage, is not sufficiently univocal to permit serious scientific usage.

**Neuroticism** (called by the BF, when reversed, *Emotional Stability*). As Loevinger (1957) early remarked, “neurosis is far too variable in its manifestations to conform to a scale model” (p. 675), which, however, the FFA indeed applies. It is also suggestive that the American Psychiatric Association, beginning with its *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.), no longer diagnostically employs the term *neurotic* or variants thereof.<sup>9</sup> This FFA domain impresses me as an overinclusive, easy-to-invoke, societally evaluative wastebasket label for an unwieldy hodgepodge of quite different personalities. It can be understood globally as referring to *susceptibility to personal distress*, however induced. I suggest that the different *N* facets offered by the NEO–

PI–R, necessarily six in number in accord with its committed planned design, do not represent a coherent or advancing construct.<sup>10</sup>

### J has 2 components T and F, not just T

**Conscientiousness.** The dictionary offers two conceptually very different—equally important and equally societally evaluative—meanings of the word: (i) Thorough or assiduous efforts to comply with external or internalized regulations, and (ii) Guided by or in accordance with the ethical dictates of an internal, self-confronting conscience, being principled, personally sensitive to issues of fairness and injustice.

FFA questionnaires completely ignore the *ethical* aspect of the term *Conscientiousness*. They focus instead and *solely* on the first meaning, as indicating the respondent’s likely *rule-abiding, diligence, assiduousness, organization, perfectionism*, whether the individual is a “good citizen.” However, pressed to an extreme, such conscientious rule-abidingness—to learned rules and prescribed behaviors—can be psychologically narrowing, lead to unquestioning conformance, stultified and highly controlled behavior eventuating in such person attributes as over-compliance, phlegmatism, passivity, and constraint. It might be more aptly labeled *Constraint*, as Tellegen (1985) suggested.<sup>11</sup> It is of interest that *Conscientiousness* is often equated with the popular Rothbart developmental construct of *Effortful Control* (e.g., Caspi & Shiner, 2006; Evans & Rothbart, 2007).

As Loevinger (1994) trenchantly noted, the term *Conscientiousness*, when considered beyond its particular interpretation within the FFA, has an essential, indisputable moral or ethical meaning—of principled concern by the individual with what is right and what

<sup>10</sup>I note that, crucially, the FFA is insensitive to two very different ways respondents may earn high scores on *Neuroticism*. Respondents *high* on *N* who *conjointly* score *high* on FFA *Conscientiousness* (which incorporates much of what earlier was called *overcontrol* or *overmonitoring of expressiveness*) manifest a different pattern of maladaptive response than respondents equivalently *high* on *N* but *conjointly* scoring *low* on the FFA *C* scale (wherein *low* *C* scores imply much of what earlier was called *undercontrol* or *undermonitoring of expressiveness*). Illustrations of these different response patterns are reported in Dahlstrom, Welsh, and Dahlstrom (1960/1975). Some items exemplifying Neurotic Overcontrol (NOC), all answered True, are “I am slow in making up my mind”; “I am afraid of deep water”; “I usually feel nervous and ill at ease at a party or dance.” Some items exemplifying Neurotic Undercontrol (NUC), all answered True, are “I must admit I often try to get my own way regardless of what others may want”; “I often do whatever makes me feel cheerful here and now, even at the cost of some distant goal”; “There have been a few times when I have been very mean to another person.” The NOC and NUC scales correlate only slightly with each other, but each is a strong indicator of susceptibility to personal distress. The six a priori personally posited FFM Neuroticism facets do not provide a fundamental, cleaving distinction between these two fundamental modes of maladaptation.

<sup>11</sup>Indeed, the hard-working, entirely dependable, organized, Holocaust implementer Adolf Eichmann would likely have scored quite highly on the conventional FFA Conscientiousness measure.

<sup>9</sup>Consider, if you will, that a *chronically depressed* individual might also be called *Emotionally Stable*!



is wrong, as experienced introspectively or manifested behaviorally. It depends on achieving what is, for too many, often a developmentally *unachieved* life phase-transition. It involves the existence of a developed inner life, a self-awareness on which ethical, morally based conscientiousness depends. *Conscientiousness* in its ethical sense, although unrepresented within the FFA, is psychologically essential and therefore warrants personological representation. The *Honesty-Humility* sixth factor identified and pressed by Ashton and Lee (2005) to some extent responds to the ethical insensitivity of the FFA.

**Agreeableness.** This societally relevant FFA factor—perhaps better named *Affiliativeness*—reflects an individual’s interpersonal behavioral tendencies. Self- (or other-) awarded adjectives related to this *Agreeableness* factor are *forgiveness, gentleness, friendliness, flexibility, patience* (Graziano & Tobin, 2002). Such ascribed adjectives likely have a certain amount of validity even when self-attributed and also when attributed to others. However, individuals politely and prudently responding to a FFA questionnaire may well have a tendency to be self-protective and carefully deferent and may erect a favorable social facade. Because of such response bias, an experienced, perhaps cynical questionnaire-user such as Eysenck (1992) can view this factor (and self-awarded *Conscientiousness* as well) as empirically and importantly displaying much self-favoring impression management, and even downright lying. Of interest, among additional characteristics attributed by others to lay individuals scoring *high* on this factor are *compliance, submissiveness, and undiscriminating affiliativeness*.

**Openness.** The *Openness to Experience* factor earlier had been called *Intellect* within the lexical BF. As embodied in somewhat transmogrified form for the purposes of the NEO-PI-R inventory (Costa & McCrae, 1992), it has been richly described by McCrae and Costa (1997) as characterizing a literate, questing, omnivorous intelligence: individuals high on imaginativeness, aesthetically resonant, attentive to inner feelings, preferring variety, intellectually curious, and (therefore) scoring higher on various intelligence measures. Empirically, it merits mention that in some samples, the *Openness* factor sometimes does not reliably emerge in analyses (e.g., De Raad, 1998). Of importance, it appears to reflect a person-quality that often is developmentally unachieved or has atrophied over the years. When something akin to it empirically does emerge, it perhaps can be more fundamentally interpreted conceptually as an indication of *perceptual* and *cognitive* responsivity (not only *behavioral* responsivity), of being exquisitely attentionally sensitive and proactively responsive to the affordances in one’s environmental surround. But some continue to

predominantly emphasize the intellectual basis, per se, of this factor (Saucier, 1992).

### The Restricted Understanding of Person-Differences by Perfunctionary Questioning of Lay Respondents

There is an unacknowledged or unweighted recognition by FFA proponents of the inherent problems residing with lay report over and beyond issues of word understanding.

First, the FFA implicitly and sometimes explicitly assumes respondents are essentially veridical and earnestly answer in good faith. Generally, FFA investigators do not check seriously or adjust for the possible presence of respondent misrepresentation although it has been repeatedly demonstrated that FFM questionnaire responses readily can be faked (e.g., Viswesvaran & Ones, 1999).<sup>12</sup> Transparently obvious self-report measures can be quick, are certainly not necessarily untrue, and are much improved if some subtly effective validity indices such as are in the MMPI-2-RF (Tellegen & Ben-Porath, 2008) are also incorporated to identify deliberately faking respondents. Accordingly, the contemporary FFA can be expected to be afflicted to some extent by misrepresentations from the targeted individual of his or her latent “surface” characteristics and by the protective “glossings” of familiars.

Second, besides the possibility of deliberate faking, FFA lay respondents can be expected to be generally society-abiding and socially prudent, unsurely cooperative, and of unknown psychological-mindedness in their awareness of self and of others. In responding to questionnaires, the reacting person—although “honest” in response—may be unwittingly defensive or may not be sufficiently self-observant and insightful to be authentically revealing. In describing “familiar” others, equivalent concerns apply—Is the informant truly providing his or her impressions of a mate or friend? Is the informant being protective in characterizing the other? Is the informant sufficiently self- or other-observant and insightful to offer usefully incisive information?

Third, with increasing frequency, participants are encountering a five-factor measure from a distance, via the Internet. There seems to be a compelling seductiveness to many investigators of convenience per se—the accumulation of computer-ready data from happenstance online visitors to an Internet five-factor measure.

However, a recent study (Denissen & Penke, 2008, p. 1291) illustrates some of the quirky sampling problems afflicting an impersonal Internet FFA approach. Their online questionnaire (including the BFI) was noticed by 3,909 Internet visitors over several months.

<sup>12</sup>But see Hirsch (2008) for a potential corrective.

Of these, 2,923 contributed some data. Of this reduced sample, 5 did not show any variance in their responses, 33 acknowledged they had not honestly responded, 112 were excluded because of the remarkably excessive time they took to complete the 5-min questionnaire, 81 were omitted because of name confusion, and 579 were deleted because they were younger than the required age of 16, resulting in a factor analysis sample of 2,113—71% female, 48% without a high school degree.

It would seem the current research ethos is that research with participants should not take much investigator time and be especially designed for trouble-free computer data processing. In the incessant search for quicker research, some have proceeded from the 240 item NEO-PI-R to the more “efficient,” 5-min, 44-item Big Five Inventory (BFI; John, Donahue, & Kentle, 1991). There even has been offered simulacra of the longer FFM questionnaire—1-min, 10-item short forms (Gosling, Rentfrow, & Swann, 2003; Rammstedt & John, 2007). Rumor hath it that an even more efficient 30-sec, 5-item form may be in the offing.

Fourth, for those professionally involved in close, intensive, and conditional person-evaluation, much of the nominal information provided by lay respondents to the extant five-factor inventories is not especially illuminating. A layperson’s response to FFA inventory questions is not seen as bearing on deeply personal—even threatening—issues such as, for example, narcissism, hostility, sexuality, repression, jealousy, compulsivity, or highly private, embarrassing, unusual, bizarre proclivities. In almost all circumstances, the perfunctory, impersonal administration to polite or captive or otherwise induced lay respondents to FFA questionnaires understandably activates a layperson’s protective façade of socially appropriate self- or other-presentation. For this reason, FFA self-report inventories are widely perceived as lacking a depth of connection with respondents. Thus, there is a level of psychological understanding that the FFA questionnaire approach simply cannot reach and reveal. There is more to the study and understanding of individual person-differences than gathering unthreatening and foreclosed self-report or person-descriptions by acquaintances.

In summary, despite the currently satisfied adherents of the proclaimed FFA, the deeper, larger issues surrounding these five broad trait categories continue for those less satisfied. For the five settled-upon factors, there remain issues as to their psychological meanings, the warrant of their labels, their denotative meaning and connotative implications, their conceptual incisiveness and sufficiency as a frame for understanding the person and the developmental progression of temperament within the person.

In the meanwhile, the claimed “emerging consensus” regarding the FFA has resulted in a cacophony

of competing, variously similar but often uncomparing five-factor questionnaire versions, in different languages, often uncertainly equivalent—all supportive of the magical number, five.

### Going Beyond the Person-Descriptions Afforded by the FFA

For some more uncertain psychologists, as the FFA came onto the stage and its popularity quickened, a gnawing question emerged: Were the BF and the subsequent FFM empirically entitled to their claims of sufficient encompassment of individual differences among persons? Regarding the BF, was the developed lexical universe of common trait descriptors exhaustively sampled? Regarding the FFM, was the NEO-PI-R all-inclusive of those aspects of character personologists deemed crucial to consider?

### Regarding the Inclusiveness of the BF

At junctures in the procedural and evaluative process initially resulting in the BF, Goldberg and his coworkers had invoked various adjective selection criteria that some questioned. Certainly, the totality of factor analysis congruences in self- and peer-ratings by available college students and lay samples was impressive. But only single-word adjective descriptors—taken alone and without context—were used and the sufficiency of single adjectives for the task of serious person evaluation could be questioned. For many personologists, the adjectival approach was viewed as providing “*surface trait*” description of persons rather than “*source trait*” understanding of persons.<sup>13</sup>

In addition, some of the guiding decisions eventuating in the then BF were troublesome to many. In particular, consequential, subjective, a priori exclusionary rules regarding what “lies outside the Big Five” framework were invoked. Thus, excluded from consideration were common-language adjectives rarely employed (although rarity of usage of a word need *not* bely its great importance)—those with low empirical base rates, those not used in polite parlance, adjectives decided as correlating too highly with the already achieved five cluster-dimensions. Adjectives describing physical characteristics were ruled out as irrelevant for understanding individual differences, although it is acknowledged more generally that such physical characteristics have important interpersonal (and therefore personality) implications (e.g., attractiveness–ugliness, tallness–shortness, obesity–skinniness, etc.).

<sup>13</sup>Meehl talked of “surface traits” as “correlated response families” and “source traits” is Meehl’s term for diverse but psychologically related expressions of the “latent source”

Aware of the frequently expressed concerns that the BF adjective domain may not be all-inclusive, Saucier and Goldberg (1998) sought to further evaluate whether, indeed, “the lexical perspective provides an unusually strong rationale for the selection of variables in personality research” (p. 499). They searched for the possible dimensions “beyond the Big Five” and indeed did find many outlier clusters. However, the BF adjective set remained unchanged by virtue of a conclusion that these outliers were “generally covering content not conventionally defined . . . for describing personality as personality is conventionally understood” (p. 520). Saucier and Goldberg acknowledged only that “*potentially*” (their italics), various independent adjective clusters may be warranted “when one wishes to extend variable, i.e., adjective, selection outside the domain of personality traits as conventionally defined” (pp. 495–496).

Unconvinced by these claims of how personality should be “conventionally” defined, Paunonen and Jackson (2000), methodologically sophisticated investigators, in their own later scrutiny of the very same data, identified “plenty” of *trait descriptor outliers* not veritably describable by the adjectives within the established BF. Illustrative descriptor outliers they found that were simply not available within the lexical BF were, for example, *masculinity–femininity*, *humorous and witty*, *honest and ethical*, *manipulative and sly*, *variety- and experience-seeking*, *sensual and sexy*.<sup>14</sup> The Paunonen and Jackson analyses, using only slightly different criteria, strongly suggested the need for a more inclusive view of person-qualities than was encountered via the self-descriptive adjectives or peer-descriptive adjectives within the BF. For very many, the additional descriptors discerned by Paunonen and Jackson appeared salient and necessary, personally.

### Regarding the FFM and the Vaunted “Recovery” of the Five-Factor Model in Alternative Person-Descriptive Procedures

Costa and McCrae, after assembling the five-factor NEO–PI, embarked on a wide-ranging research program to justify their five-factor approach. However, their strategy centrally depended on an *interpretive asymmetry* that is logically unappreciated. In their hectic early body of work, they sought to demonstrate the “validity” or universality of their five-factor model by “recovering” their postulated five factors from a variety of preexistent person-evaluating procedures. They did not ask the reverse question: Can the person-evaluating

procedure they evaluated retrieve their FFM five-factor structure and perhaps more than their five factors?

Among the methods in which they reported successfully “recovering” their five-factor structure were Jackson’s Personality Research Form (Costa & McCrae, 1988) embodying Murray’s needs, the widely and long-used Minnesota Multiphasic Personality Inventory (Costa, Busch, Zonderman, & McCrae, 1986), the popular California Psychological Inventory (McCrae, Costa, & Piedmont, 1993), and what they called the CQS, more widely known as the California Adult Q-set (CAQ) (Block, 1961, 2008). For obvious filial reasons, I focus here on their CAQ analysis, first to describe the basis of their interpretation and then to suggest a contrary view.

The CAQ is a set of person-evaluating statements *commensurately* and *independently* used by experienced and trained clinical psychologists and psychiatrists, often *aggregated*, to assess the *relative salience of person-qualities* in a *closely-scrutinized* individual. Typically, in research, the qualities of a person are denoted by independently formulated, commensurate, subsequently aggregated assessments by clinicians or person-assessors. It is *not* intended for use by individual laypeople to describe themselves, their spouses, or their peer-acquaintances because it assumes that self- or spouse- or peer-descriptions are often not informationally trustworthy or psychologically perceptive enough. Also, the nonproprietary CAQ is *person* oriented, not *variable* oriented. It is not so quick or convenient or inexpensive to employ as are hand-out questionnaires or adjective lists.

McCrae, Costa, and Busch (1986) described their analysis of the CAQ as representing

a unique opportunity to test the generality of the five-factor model . . . because the content of the CQS . . . was determined solely by the judgments from psychodynamically oriented clinicians. . . . If the five-factor model can be recovered from the items of the CQS, its claim to comprehensiveness will be considerably strengthened. (p. 432)

In the McCrae et al. study, rather than having serious clinicians each portray a commensurate evaluation of a subject, participants were mailed the CAQ and were asked to describe *themselves* at home via the CAQ procedure. They also responded, via mail, to an early version of the NEO–PI and to adjectives representing the BF.

In their factor analysis of the self-sorted CAQ items, an orthogonal five-factor varimax solution was first sought. To better fit their data, however, and because, as they acknowledged, “factor interpretation is a subjective process” (p. 439), it was decided to further rotate two of their factors by 30°. They concluded that the content of the five CAQ factors resembles the content of the FFM-based and BF-based five factors. Subject

<sup>14</sup>I note that each of these “outliers” could readily become indisputable factors were each to be redundantly represented so as to build up their communalities.

CAQ-based five-factor scores proved to correlate attractively with the FFM and BF factor scores of the participants and also with FFM and BF scores alternatively derived from spouses and from participant-nominated friends. Even further, McCrae et al. reported that CAQ five-factor descriptions by available watchers of a 40-min life-history videotape of each of more than 100 members of their participant pool also showed a convergence with the FFM and BF model. Watchers were described as technicians, psychologists (of unspecified background), and a single psychiatrist. Later, a single second judge (of unspecified background) viewing the videotapes provided impressions of each of the more than 100 participants via the NEO-PI.

I do not question that this “recovery program” educated the intended five factors; I would be distraught otherwise. I do question the widely referenced conclusion in their abstract that “these findings strongly support the claim to comprehensiveness of the five-factor model” (p. 430).

First, to comment more specifically on their study, note that in their CAQ item-factor analysis, McCrae et al. reported obtaining as many as 32 eigenvalues greater than 1.0, the widely recognized mathematical threshold above which factors can be said to exist. However, this 1.0 threshold is influenced by data noise, and so establishing the number of stable, replicable factors within a particular factor analysis has long presented a difficult problem to users of the method. Beyond their five-factor solution, McCrae et al. tried an eight-factor solution of their CAQ item intercorrelations. “In the eight-factor solution, three new factors emerged, along with versions of the original five.” One of these three new factors betokens *introspection* and a complicated inner life, a second new factor reflects *forcefulness* in social interaction, and the third acknowledges *physical attractiveness* as influencing one’s personality. They also found Neuroticism to be much more articulated than a summary label would justify and found the emergence of *erotic interests*. Unfortunately, they did not pursue these findings; perhaps increasing the number of factors would increase the predictability of real-life criteria (Mershon and Gorsuch, 1988).

In their Discussion section, they acknowledge that

whether the five-factor model is judged to be adequate or not in part depends on what one chooses to include within the definition of personality . . . researchers and clinicians should recognize that measurement of the five factors themselves gives a *complete* [italics added] characterization of the person only at a *global* [italics added] level. . . . The factors represent groups of traits that covary but are not necessarily interchangeable. (pp. 443–444)

A later article (Lanning, 1994) offers further perspective on the CAQ, when used as intended by mo-

tivated and relatively qualified observers. Lanning’s major analysis used CAQ data from the Institute of Personality Assessment and Research of the University of California at Berkeley, based on five-observer composites available for each of 940 participants (58% male). Participants had been observed in groups of 10 over sustained, interactional weekends. Observer-judges were present during close participant interviews, leaderless discussion groups, a variety of social settings (meals, coffee breaks, social games like charades, etc); observers were members of the Institute of Personality Assessment and Research professional staff and advanced graduate students in personality psychology. A total of 61 observer-judges provided CAQs, with no judge serving on more than four weekends. This arduous research arrangement represents an approach and commitment by assessors at an entirely different level than simply mailing the CAQ to available participants for self-evaluation homework and return.

When Lanning submitted the accumulated CAQ composites to a *five-factor* analysis, CAQ factors like *Neuroticism*, *Agreeableness*, and *Extraversion* clearly emerge, a CAQ factor somewhat similar to the *Openness* factor is seen, and the last CAQ factor appears to connote self- or executive- or ego-control more than the work-ethic typically central to *Conscientiousness* as expressed within the FFM.

When an *eight-factor* CAQ solution was tried, three additional factors emerged, reflecting *Physical Attractiveness* (including heterosexual interest and charm), *Insight*, and *Ambition* (similar to the additional factor noted by McCrae et al., 1986).

When an *11-factor* CAQ solution was computed, additional factors representing *Hostile Candor*, *Narcissism*, and *Humor* were found. When a 15-factor CAQ solution was sought, factors of *Sensuality* and *Somatization* appeared and the previous *Insight* factor split into factors of *Social Acuity* and *Concern with Motives*.

An especially interesting—and implicative—analysis by Lanning involved partialling the five-factors derived from analysis of a large sample ( $N = 822$ ) of his CAQs from the CAQs of the sample remaining ( $N = 118$ ). His Table 4 reveals 21 CAQ items that, *after five-factor partialling*, were reliable but could *not* be represented within the common five-factor space (e.g., *physically attractive*, *skillful in social play*, *masculinity/femininity*, *heterosexual interest*, *initiates humor*, *sees self as attractive*) and therefore were *not* amenable to the FFA.

Lanning noted a number of reasons for this greater complexity of results from the CAQ: First, there is a great difference between single-word adjectives and simple self-statements as in the FFA and, alternatively, CAQ items such as “is uncomfortable with uncertainty and complexity,” “feels a lack of meaning in life,” “has repressive or dissociative tendencies,” “is

self-dramatizing, histrionic.” Such CAQ items have a clinical origin; equivalent single-word adjectives are unlikely to emerge in lexical sampling and, accordingly, “the CAQ may include characteristics that are poorly represented by trait adjectives” (p. 159).<sup>15</sup>

Second, “CAQ items differ in breadth as well as in content from single-word or self-statement descriptors. The use of conjunctions, qualifiers, elaborations, and context inherently reduces the scope of these items. Trait adjectives, particularly those in common use, are typically broader” (John, Hampson, & Goldberg, 1991, p. 159). The trait adjective, *sensitive*, for example, can refer to a number of CAQ items, including “is thin-skinned, sensitive to criticism,” “is esthetically reactive,” and “seems to be aware of impression s/he makes on others.”

Third, there is widespread acceptance in medical and other fields that specialists can validly discern and effectively communicate to others distinctions *not* discernible by laypeople (see, e.g., Tanaka & Taylor, 1991). It is a natural extrapolation from this well-accepted recognition that psychologically sophisticated, experienced, disinterested person-evaluators can be expected to provide more differentiated understandings than opportunistically available lay FFM or BF responders. I suggest that lay respondents to impersonally administered, printed self- or other-inventories are often motivationally not deeply involved, are usually socially prudent, and often are not psychologically minded enough in their awareness of self or of others. Fourth, there is no question that the repeatedly observed, famed five-factors indeed can be found within the CAQ and can be “recovered.” But their “necessity does not imply sufficiency, despite inferences in the literature that the five factors ‘underlie,’ ‘comprehensively characterize,’ ‘subsume,’ and ‘account . . . for’ the CAQ factor structure” (Lanning, 1994, p. 159).

By reversing the research question posed by McCrae et al. (1986), it is clear from both their own analyses and from the later Lanning study that although the five-factor structure of the FFM or BF indeed can be found within the CAQ, the CAQ’s extensivity of content importantly cannot be recovered solely from the five-factor structure. Many reliably positioned CAQ items are not redundant enough (quite deliberately) to emerge as factors and so provide little computer grist from which the factor analytic algorithm can make them factors. As a consequence, the delimited FFA cannot express such psychologically important person qualities, as noted by Paunonen, Jackson, and Lanning, as: *masculine-feminine, humorous and witty, honest and ethical, manipulative and sly, sensual and sexy, physically attractive, charming, ambitious, hos-*

*tily candorous, narcissistic, somatizing of problems, socially acute, and concerned with motives.* It appears that lay characterizations in terms of the five broad factors may not provide a rich description of an individual person. As Allport (1961) warned, “common speech is a poor guide to psychological subtleties” (p. 356). It may be sufficient for expressing “folk concepts,” but there may well be insufficiencies in lay common-language for characterizing the complexities and unfoldings of human nature. “As scientific constructs [personality conceptions] should be formulated with no necessary regard for their usability and understandability by laypersons” (Block, 1995a, p. 188).

### Transformational Developments in Regard to the FFA

By the end of the 20th century, the proprietary FFM, although having become preponderant in published (and unpublished) research on personality, had also been recognized as having insufficiencies, methodological intertwined with the conceptual.

Consequent upon relying on the factor analytic model, it had always been recognized that understandings of the person may exist at *several* different hierarchically related levels. At the very lowest level is the *person-discriminant*, the particular behavior or expression by the person of his or her position with respect to a matter of personological interest. If sufficiently covarying, a collection of discriminants can conceptually warrant being aggregated to form what have been called a *facet*. Facets, in turn, if justified by their intercorrelations, may further warrant further aggregation to constitute a factor-domain—one of the five factors. (And, in turn, the factor-domains, to the extent they correlate, may imply the more ultimate presence of “higher order” superfactors or “metatraits.”)

It will be remembered that, in developing the FFM initially, Costa and McCrae implemented a personal, prior, unexpressed, but result-shaping theoretical model that achieved wide usage in the field. After evolving their three desired NEO factor scales, which they characterized as representing broad “domains,” they partitioned each of these three factor scales domains into six lower level subdimensions or “facets,” with each facet consisting of eight NEO-inventory statements or “person discriminants.” Crucially, in faceting each of their three factor scales, they appear to have relied on their own subjective understandings of the personality literature as supplemented by their own dyadic decisions. It is unclear how much of the machinery of factor analysis was employed at this juncture.

Subsequently—to enhance comparability and connection with Goldberg’s prior BF—Costa and McCrae constructed two new inventory scales analogous to the two BF factors they lacked and added them to their

<sup>15</sup>I suggest that the short, simple sentences in the FFM questionnaire often carry no more information than single-word trait descriptors.



three-factor NEO-PI. The two new scales—targeting *Conscientiousness* and *Agreeableness*—were also conformed to their preestablished pattern of six facets, each consisting of eight inventory items.

The Costa and McCrae presentation of their now FFM into lower level facets was generally not questioned and proved convenient and attractive to many subsequent NEO-PI-R users. However, although based on thoughtful, considered judgment, the facets specified for each domain were bothersome to many as well; the particular facets posited would have been importantly different had psychologists of different persuasion done the positing and/or had a different set of inventory statements been involved. Thus, there have been conceptual, disputative, jangling questions regarding these prescribed FFM facets, their meaning, and appropriate domain placement. The study seeking to demonstrate the discriminant validity of the 30 NEO-I-R facet scales (McCrae & Costa, 1992) via their patterns of correlation with person-adjectives found clear differences between the factors but unclear distinctions among the posited facets of a factor.

In the intervening years, the proprietary NEO-PI-R has not been subject to further change beyond some psychometric tunings within a few of its a priori facet scales, resulting in the issuing of a modestly improved NEO-PI-3 (McCrae, Costa, & Martin, 2005). Further or radical changes in the NEO-PI do not seem to be envisaged by its proponents. “The five factors do not exhaust the description of personality; they merely represent the *highest* [italics added] hierarchical level of trait description” (Costa & McCrae, 1995). That is, although the facets exist at a lower level of the factor hierarchy than the five factors, the FFM posits there is not a higher level of person understanding above the five factors. McCrae and Sutin (2007) recently have offered an extensive “preview” of possible future five-factor research that is limited entirely to research with the existing NEO-PI-R.

This historical recounting of the FFM’s facets and scales sets the stage for understanding some developments in the new century. In particular, Goldberg (1999)—the BF progenitor but also a long contributor to and innovator of person-assessment by means of inventory responses—has proposed some fundamental changes in the way personality inventories might be better developed and further evolve. Goldberg’s projected changes initially languished but more recently have generated much attention and consequence (Goldberg et al., 2006).

His vision involved establishing a freely available “broad-bandwidth, public-domain, personality inventory measuring the lower-level facets” of person-behavior (which he called the International Personality Item Pool, or IPIP). Goldberg’s specific suggestions were several: Because he was dismayed at the slow pace of progress by personality assessment in the

last century—attributing it to the encumbering dominance in the field by conveniently available but proprietary, insufficient instruments—he proposed a public domain approach freely and extensively available to all. He further recognized that the most catholic approach to person-assessment would be to focus on the *full*, perhaps ever-expanding range of narrow-bandwidth person-discriminants rather than focusing on preordained, broad band width factors (the current IPIP includes far more than 2,000 items, many of them due to the Gronigen contingent of Hofstee, de Raad, and Hendriks and has been translated into more than 25 languages). He further acknowledged that single-word person-descriptors, as prioritized earlier in his “Lexical Hypothesis,” are importantly deficient when international usage is envisaged and that a more contextualized, somewhat longer common item format of short verbal phrases is more desirable. Finally, he envisaged the enormous potential afforded by the Internet: mutual research communication, easy data interchange, and cumulative, refining progress in questionnaire construction. His cost-free, public domain, asymptotically growing IPIP item universe is readily and flexibly available worldwide to investigators and already has catalyzed almost 100 publications.

The research possibilities afforded by Goldberg’s IPIP may be exemplified by (but are not limited to) an early application by him employing data from his large Eugene-Springfield community sample (ESCS). The participants had earlier been administered the NEO-PI-R questionnaire and individual scores on the 30 NEO facets had been calculated. However, also and separately, the ESCS participants had been administered the then IPIP. Each item of the IPIP was correlated with each of the 30 NEO-PI-R facet scores separately available, and the IPIP items relating to each of the NEO facet scales were identified. This elaborate but now computer-easy analysis issued IPIP 10-item scales faithfully representing each of the 30 NEO facet scales. Indeed, psychometrically, the IPIP empirically based facet scales appear slightly superior to the initially proposed and now proprietary NEO facet scales, correlating .94 with them when corrected for attenuation. However, and crucially, the IPIP 10-item scales empirically indexing the 30 NEO-P-R facet scales are not proprietarily dependent on or limited to the NEO-PI-R and may be further modified or improved at will.

Many equivalent analyses exist and testify to the fecundity of this enlarging public domain approach. It would appear that many kinds of already established personality scales can be duplicated and likely bettered by Internet processing of the extensive, readily accessible resources of the IPIP and already available databases.

As a further instance, a recent IPIP analysis claims attention (DeYoung, Quilty, & Peterson, 2007). These investigators were motivated to factor—for each of the

five domains—the ordained facets of the NEO–PI–R. In addition, because the AB5C two-dimensional circumplex structures generated by Hofstee et al. (1992) provided better coverage of the range of personality-behaviors than the NEO–PI–R facets provided by Costa and McCrae, they also studied the scope of the publically available AB5C–IPIP facets.

Referencing the large ESCS sample, each of the five FFA inventory scales, when factor-analyzed, displayed two subfactors. The Neuroticism items suggested separation into two subfactors, labeled Withdrawal and Volatility,<sup>16</sup> the Extraversion items suggested subfactors of Enthusiasm and Assertiveness, the Agreeableness items grouped into Compassion and Politeness subfactors, the Conscientiousness items suggested subfactors of Industriousness and Orderliness, and the Openness/Intellect facets grouped into subfactors of Intellect and Openness. These subfactors were hierarchically positioned *above* the ordained facets of the NEO–PI–R or established AB5C–IPIP facets but *below* the five FFA “domain” scales; they were more than facets but less than domain factors. Requiring a distinctive name, these conceptually attractive subfactors were dubbed “aspects.”

Having established factor scores reflecting each of the 10 different “aspects,” it was easy enough—in these computer times—then to correlate each aspect with each of the more than 2,000 public domain IPIP items administered to the ESCS. By so doing, and identifying those items that were especially good markers of an “aspect,” it proved possible to create an assessment instrument indexing each of the 10 BF aspects. With a preliminary version of their Big Five Aspect Scales in hand, a quite different participant sample substantially cross-validated and refined their effort. Their Table 4 provides compelling evidence psychometrically and conceptually of the usefulness of functioning at the aspect level intermediate to the previously offered, dyadically based, narrower facet level and the overly broad BF factor level. It is the unusually deep resources of the IPIP that allowed psychometric creation of replicable, public domain scales to index the newly available 10 aspects of the BF. Conceptual, empirical aspects might well replace usage of the prescribed, NEO–PI–R offered FFM facets.

### Converging Toward Higher Order Personality Superfactors

Deeper analyses of the FFA approach—particularly the FFM—have long been occurring. Theoretically, it had always been recognized that understandings of

personality may exist at *several* different hierarchically related factor levels. However, with respect to the FFM, the full implications of this recognition had been evaded. Thus, as noted earlier, Costa and McCrae noted that the five factors are not exhaustive of personality, but rather represent the highest level of trait description. The claim is that there is not a higher level *above* the five factors.

However, because of the empirically observed, repeated correlations *among* the five broad factors constituting the FFM, there arose an interest in factoring efforts going beyond the promoted five—to seek higher order, more abstract factors of wider, more general implication than those of the “basic” five-factor model.

The supposed orthogonality of the FFM had long been recognized as presumed rather than real; such orthogonality had been imposed by the use of a particular method of analysis and rotation. Empirically, factor dimensions ordinarily are not orthogonal and, in principle, they should not truly be expected to be. If extracted by a mathematical algorithm that is psychologically innocent, orthogonality may be assured, but it is quickly lost when the mathematical abstractions are given psychological content, typically implemented by evaluating item summations selected to represent the factors. Although FFM dimensional scores ostensibly should be orthogonal, empirically they are not—each of the five factor dimensions is indeed correlationally linked with other of the five factors. This recurrent observation obviously suggested to many the relevance and perhaps usefulness of seeking the consequence of a higher order factor analysis than the earlier-proclaimed FFM.

Digman (1997) was the first to act upon this recognition. He took 14 different correlation matrices each showing five-factor solutions. In various, reasonably sensible ways, he allowed the five factors of each matrix to achieve its natural nonorthogonality. Sometimes he computed factor scores by factor loading weightings, sometimes he took the intercosines of axes from a nonorthogonal (promax) rotational solution, often he took the correlations among trait scales designed to reflect the five factors; his samples were of different ages and culture.

Digman’s analysis of these 14 five-factor correlation matrices—each one based on the correlations among the five nonorthogonal factors—indicated to him the general existence of two robust higher order factors above the BF. These were interpreted by him in broad, abstract terms. His first, repeatedly observed, higher order factor, which he non specifically termed *Alpha*, he suggested as representing what he called “the socialization process,” involving the FFM factors reflecting *Neuroticism* (reversed), *Conscientiousness*, and *Agreeableness*. These three converging factors implied to him an *Emotional Stability* he conjecturally viewed as integral to the necessary basis for any stable society.

<sup>16</sup>The two mid-1950 scales, NOC and NUC—by their construction—appear to make the same basic distinction with respect to Neuroticism as the recent Withdrawal and Volatility “aspects.”

The second higher order factor of Digman, also non-specifically named, was *Beta*, and vaguely interpreted by him as “personal growth” (vs. “personal constriction”). He viewed it in more uncertain, groping terms such as Maslow’s (1962) notion of “self actualization,” Tellegen’s Positive Emotionality, a venturesome encountering of life, and surgent imaginativeness. Again referencing the prior established FFM five-factors, he found this higher order factor stems from *Extraversion* conjoined with *Openness to Experience*.

Becker (1999), in his own higher order analysis of the FFA, came up with two similar higher order superfactors, which he labeled “*mental health*” and “*behavior control*.” Carroll (2002), a well-respected factor analyst but one not versed in personality issues, in a posthumously published and largely unnoted hierarchical analysis of a previously unworked data set of teacher ratings, found the usual five-factors at an intermediate level but two higher order factors above the proclaimed “big five.” He chose to call them “*general goodness of personality*” and “*personal growth*” versus “*personal constriction*.” DeYoung, Peterson, and their coworkers in a series of diverse studies (DeYoung, Hasher, Djikic, Criger, & Peterson, 2007; DeYoung, 2006; DeYoung, Peterson, & Higgins, 2002; DeYoung, Peterson, Seguin, & Tremblay, 2008), distilled their several five-factor matrices into two equivalent higher order factors—the Big Two—they chose to christen as “*Stability*” and “*Plasticity*.”<sup>17</sup>

These several studies, all arising from different persuasions and different sets of data, testify to the sturdiness of the findings: They *all* agree in grouping together *Emotional Stability* (i.e., *Neuroticism*, reversed), *Conscientiousness*, and *Agreeableness* as constituting the one superfactor or metatrait and the second superfactor or metatrait as being a fusion of *Extraversion* and *Openness*.<sup>18</sup> The recent, complex, comparative, all-embracing study by Markon, Krueger, and Watson (2005) also concludes, after evaluating various “Big Trait” factor analyses: “The hierarchy does descend downward from the Big Two traits” (p. 153). Currently,

<sup>17</sup>Naming factors is a disputacious undertaking. The awarded names of these two metatraits impress me as not quite apt, communicatively. In the next section, I attempt a larger discussion of these higher order factors that remains faithful to their essence and connotations but escapes some unfortunate implications of their initial names.

<sup>18</sup>Of interest, Muek (2007) and Rushton & Irwing, (2008) went even further in their hierarchization. They suggested that *one* general personality factor underlies the understanding of personality. So, conceptually, the factor analytic hierarchical approach to personality may be said to proceed from its very lowest level, *personality discriminants*, to the next higher factor level, the organization of discriminants into (nonarbitrary) *facets*, then further into a higher organization of these facets into a half dozen or so *midlevel factors* (as represented by the FFA), a further grouping of these midlevel factors into two higher order factors, and the culmination of everything into a solitary, apical general factor signifying only something like *fitness for collective living*.

it seems fair to suggest it is the Big Two higher order factors from which all lower order factors hierarchically devolve.

In response to these accumulating, separate findings of higher order factors existing above the FFM, a perhaps countering argument has appeared from McCrae et al. (2008). They suggest that the repeated finding of two higher order factors admits of quite another interpretation: “An alternative is that they are method artifacts and that the five factors are themselves orthogonal” (p. 443). They suggest that the existence of higher order factors derives from the existence of informant-specific effects and that “such informant specific effects are generally interpreted as artifacts, biases that contribute to observed scores because of the method used rather than as a reflection of the true score” (p. 443).

As viewed in these terms, there is a contrast between two sources of FFM questionnaire variance: (a) “artifact,” informant-specific effects arising from differently describing sources, such as self, parent, spouse, acquaintance, an aggregate of multiple informants, and so on, and (b) “substance,” the “true” or “real” scores revealed by the five factors. McCrae et al. view informant-specific effects as an expression of “artifact” extraneously influencing five factor scores, and therefore believe these effects should be excluded, thus allowing the true “substance” within the FFM to emerge.

From this presumption—not uniformly accepted—that informant specific effects are generally interpreted as “artifacts,” they proceed through a complicated series of analyses and conclude that “there are alternative interpretations of the present data” (p. 452). They acknowledge that the two higher order factors repeatedly found by various investigators may be “real phenomena that shape the intercorrelations of the Big Five traits” (p. 452); that is, they are *not* completely artifactual. But they also suggest that the two higher order factors “might be accounted for by widely shared schemas concerning the covariation of traits” (p. 452). They conclude by reasserting that “the Big Five are in practice the highest accessible level in the personality trait hierarchy” (p. 453). The McCrae et al. analysis warrants further close consideration, wider replication, and especially the broader consensual evaluation it has not yet received.<sup>19</sup>

Meanwhile, a spate of related studies has appeared that, taken together, may have moved personality un-

<sup>19</sup>Another argument against the existence of higher order factors has appeared (Ashton, Lee, Goldberg, & de Vries, 2009). It is complicated also, in a different fashion than the McCrae argument, and conjectures that self-evaluative bias might account for the apparent existence of higher order factors. However, analyses based on multi-informant ratings also continue to issue higher order factors (DeYoung, 2006), a finding that cannot be ascribed to self-evaluation bias.

derstandings beyond the FFM preference that the five factors continue their reign as “basic.” The two higher order factors repeatedly found have been demonstrating unusual, deeper, far-afield relationships not readily construable in terms of the nominal five. In particular, a neurobiological conjecture as to what underlies the two metatraits has been especially provocative. If further supported and extended, this development has the promise of grounding the study of individual differences within a biological context having personality and interpersonal significance. In a first, intrepid article, DeYoung et al. (2002) did not only establish that two higher order factors, tantamount to *Alpha* and *Beta*, indeed subsumed the long-proclaimed “big five.” They further conjectured that their two higher order factors are expressive of the neural structures organizing serotonergic and dopaminergic function, respectively. From an intriguing evolutionary rationale for the kinds of behaviors subserved by serotonergic and dopaminergic function, they extrapolated ambitiously, suggesting an empirical test of their broad, innovative scheme: high scorers on *Stability*, a multi-interpreted label (discussed shortly) they preferred to the prior labeled *Alpha*, should show more *conformity*,<sup>20</sup> as measured by several social desirability measures (the Paulhus Impression Management Scale and the Eysenck Lie Scale), than low scorers. In two separate, sizable samples, in addition to replicating the existence of their two higher order factors, findings supported their expectation that measures of conformity related importantly to their *Stability* factor and that, after controlling for the scales that make up *Stability*, related negatively to the *Plasticity* factor, their preferred name to *Beta*.

Another article (Peterson, Smith, & Carson, 2002), together with a successful replication, demonstrated that what they called *Plasticity* characterizes individuals with *reduced* Latent Inhibition (LI). LI is a preconscious gating mechanism in the brain, screening from conscious awareness ongoing stimuli earlier experientially established as task-irrelevant. The brain, by ignoring stimuli previously identified as unimportant, reasonably tends subsequently to *not* attend to such stimuli. However, *reduced* LI (i.e., unattenuated perception) permits further attention to the ongoing stream of stimuli and has been associated with dopaminergic neural function. The finding of great implicative interest here is that individuals with higher levels of *Beta* or *Plasticity* (Openness and Extraversion) characteristically manifest reduced LI, a most unusual and theoretically suggested, suggestive finding.

<sup>20</sup>The concept of “conformity” also is better measured by a “differential” model rather than a “cumulative” model. One can be excessively conforming and insufficiently conforming. An intermediate, curvilinear level of responsivity to the context has more adaptive possibilities and occupies the more adaptive portion of the dimension.

Yet another article (DeYoung et al., 2007) relates circadian rhythm theoretically to the *Stability* metafactor via the dependence of both on serotonergic function. If replicable and extended, this may be another herald of a neurobiological connection to personality. Further assessing this possibility, Hirsh, DeYoung, and Peterson (2009) provide an intriguing hypothesis and a further test that behavioral differences are neuropharmacological expressions of the individual’s serotonin and dopamine systems. Within the Eugene-Springfield community sample long and extensively studied by Goldberg, 307 participants and their multi-informant peers had responded to the BFI about the subject. Also, at a different time, participants had indicated the frequency with which they engaged in a wide variety of activities during the preceding year. These numerous activities subsequently were brought into a more simple form and further organized by means of cluster analysis.

From the BF scores of the participants, their metatraits of *Stability* and *Plasticity* were readily derived and correlated with each of the behavioral clusters. The analyses were complex, aimed at forfending alternative or complicating interpretations. As conjectured, for the *Stability* metatrait, the 10 highest and significant behavioral cluster predictors reflected *constraint* and were *uniformly negative*, including *sex* and *laughter*. For the *Plasticity* metatrait, the 10 highest and significant behavioral cluster predictors reflected *engagement* and were *uniformly positive*, also including *sex* and *laughter*. These findings conjoining entirely separate and different data sets conform impressively well to previously expressed interpretations of the *Stability* metatrait as reflecting serotonergically mediated *self-regulation* and *constraint* whereas the *Plasticity* metatrait reflects dopaminergically mediated *exploration* and *engagement*. Serotonin has been reliably associated with impulse or overcontrol (Carver & Miller, 2006), whereas dopamine has been reliably recognized as associated with exploratory, engaged, unconstrained behaviors (Panksepp, 1998), what we earlier called *undercontrol of thought and behavior* (e.g., Block, 2002).

The Peterson–DeYoung approach impresses me as having achieved appreciable significance and demonstrated unusual arenas of fertility for person-characterization via inventory responses. Crucially, it has the adaptive virtues of conjoining both the imbedded motivation toward stability with the imbedded motivation toward responsiveness to novelty. This line of research is thought-provoking and may well, if more widely demonstrated and extended, move the understanding of person-behaviors from inventory responses to the biological realm. This biological grounding of the two higher order factors may open up new, advancing, theoretical possibilities undreamed-of earlier within the FFA.

### Observations on Where We Are Now and Some Suggestions

Of course, I well recognize that the ever-changing field of personality psychology defies summary; “wise” projections as to its future are rash indeed. Nevertheless, a few remarks after this long peregrination seem in order.

First, some suggestions are obvious and simply involve better scientific practice. There must be effective specific replication and extended wider, generalizing evaluation within the personology community of attention-gaining results—by other than the original investigators. This responsibility is absolutely required scientifically. More attention should also be addressed to psychometrics per se as well as factor analysis and structural equation modeling. There needs to be better recognition of the weaknesses and strengths of various approaches to evaluating the dependability or quality of measurement (Hunter & Schmidt, 2004). For example, a high coefficient alpha may sometimes be only a reflection of the remarkable redundancy of questionnaire statements as in the still widely used Rosenberg (1965) measure; there is unawareness of the possibly influential, misdirecting effects of attenuation (Schmidt, in press), and there is neglect of the possibility of untoward effects of score range restriction/enhancement or the unusualness of the sample on one’s findings (Schmidt, Shaffer, & Oh, 2008). Also, the person-manifestations studied should be diverse, brought into a comparative frame by standard or T-scoring, aggregated whenever feasible to enhance reliability (and consequent validity), with analysis not limited solely to ineluctable personality questionnaires but also to disparate, far-removed measures such as, for example, the Stroop Test, the Rod-and-Frame Test, Reduced Latent Inhibition, short-term memory, visual tracking ability, breadth of visual attention, extent of the individual’s “fundamental attribution error,” kind of moral reasoning, and so on. The ultimate goal is achieving a broadly ranging, coherence-suggesting nomological network.

Second, the cumulating, Internet-oriented, public domain approach catalyzed by Goldberg (1999, Goldberg et al., 2006) involving the IPIP has appreciably broadened and enhanced the scientific possibilities of the inventory approach and has seen increasing and widespread research usage in the larger personality field. His proposed changes have the promise of transforming accomplishment and practice in the field. In my view, his suggestions can become a revolutionary, unifying, and scientifically cumulative approach to the heretofore unmanageable, redundant, and lacunaed field of person-assessment. The changes he suggests have the promise of transforming inventory practice and accomplishment.

Third, the tactic of “geometric blending” of factors according to two-dimensional circumplexes, as

introduced by Hofstee et al. (1992), is intriguing and useful but, I suggest, not quite sufficient. In application, it blends only two factors at a time, omitting the undoubted interactive influences of additional factors. Such restricted blending cannot represent the dynamic, sometimes disjunctive, interaction of all of the factors functioning within the particular personality system.

Fourth, as models go, factor analysis and structural equation modeling are extremely useful per se, but this linear approach—useful as it is—hardly provides a model of the human being as a complex adaptive system. Rather, the factors emanating from factor analysis represent separated, “purified” behavioral tendencies—each more or less dominant—in the organism. However, considered within the organized organism, the individual’s characterological system is better viewed as *dynamically* reactive and interactive in accord with genetically ordained temperament, subsequently evolved habituations, and the surrounding context. The goal of the study of personality is “to provide an *integrative* [italics added] framework for understanding the whole person” (McAdams & Pals, 2006, p. 204).

Prestructured by the BF (but not by the higher order factors subsuming them), Van Egeren (2009) offers a more specific, system-adaptive conceptualization of BF functioning. He views *each* of the five broad trait factors as having “adaptive propensities,” latent system-regulatory behavioral rules responding to the embedded “pulls/pushes” of the particular factor. His elucidation of cybernetic regulation for each of the five “adaptive propensities” offers “causal clarity” in understanding how each of them influences behavior. The work deserves wide and close reading although, in particular, I disagree with Van Egeren’s construal of the Openness to Experience factor as focused on “reward prediction.” And the grand, perhaps ever unachievable but luring question regarding the dynamic organization of these five separate “adaptive propensities” into a complex adaptive system remains unconsidered.

Fifth, in my view, the long-held BF factor called, confoundedly and confusingly, Intellect/Openness to Experience, has been unfortunately treated. In certain personality-studied samples, this factor is empirically relatively small and variable in magnitude (even nonexistent on occasion). Reflection and living in the real world can be intrusively informing and more influential than muddled, distantly derived factorial results. Such reflection suggests that having a high Intellect does not guarantee one’s being, therefore, Open to Experience, whereas Openness to Experience may not necessarily entail what is conventionally thought of as Intellect or “general mental ability.” Individuals with high intellect certainly may be smart but also so narrowly channeled they may be relatively insensitive to and unaware of circumstances especially eliciting of experiential, expressive openness, emotionalized verbal or bodily language



like a piercing poetic phrase or the anticipations inherent in sinuous duo-dancing. Likewise, the indubitably unusual restructurings and awarenesses of an individual may not augur especial intellectual ability in the “IQ” sense. Such unusually perceiving, kaleidoscopically attentive individuals may be naive, mundane, and even psychotic. The past empiricism showing an important correlation between measures of intelligence per se and measures of unusual perceptions, sensing, and cognitions is due, I suggest, to the specialness of the samples that happen to have been evaluated.

Conceptually conjoining both Intellect and Openness to Experience impresses me as limiting. Indeed, in earlier analytic work (McCrae & Costa, 1985a, 1985b), McCrae and Costa considered Intelligence as a sixth dimension minimally related to Openness to Experience (McCrae, 1993–1994, p. 47). Conjoining general mental ability with openness combines two very different person-capacities better left asunder. A simple and simplifying solution to this confounding problem is to cleanly conceptually separate these two important, differential qualities presently conjoined. With respect to Intellect (or general mental ability) per se, personology needs to recognize and accept differences along this dimension as having definite, appreciable, long, and diverse real-life personality implications for the lives people create and live (as personal musing will immediately attest). General mental ability has been viewed as “an all-purpose life-tool” (see, e.g., Gottfredson, 1997; Lubinski, 2004, 2009); it should not be relegated, as it has been in much of the history of psychology, exclusively to study of the separate, non-personological domain of the structure of intelligence (Jensen, 1998). It is crucial for understanding the ways a personality develops and functions.

Given the largely unspecifiable range and flow of experience, contemporary evolutionary understandings suggest that individual variation in intelligence—by which I mean adaptive resourcefulness—is predicated on and emerges from an interactive set of *domain-general* competencies (e.g., working memory, inhibition, fluid intelligence, habituation, response latency, statistical learning, associative learning, metacognition, imitative ability, mind-attribution). The individual’s particular suite or repertoire of these interrelated domain-general abilities can be said to underpin what is often called “native intelligence,” the widely opportune mental ability to adaptively find coherence or possibility amidst the incoming onslaught of limitless environmental inputs.

Given the dynamics of complex adaptive regulation, individuals vary widely—innately and in their life learnings—in their ability to adapt to their personal life situation and the flux of their experience, to equilibrate and re-equilibrate in response to their ever-changing being and their ever-changing world. But, as Depue, Collins, and Luciana (1996) tellingly remark, “Adap-

tive behavioral systems, in the broadest sense, are really emotional systems that motivate and, in a general way, guide behavior in response to critical stimuli” (p. 48). Accordingly, individual differences in mental ability or intellect intrinsically relate to personality development and social functioning. It warrants unique study rather than a confounded focus.

Sixth, if Intellect is respected but partitioned away as separate, a purified Openness to Experience dimension can be better understood and evaluated. The articulated concept of Openness gradually emerged from the course of various earlier studies (As, O’Hara, & Munger, 1962; Cattell, Eber, & Tatsuoka, 1970; Coan, 1974; Fitzgerald, 1966; Kris, 1952; Tellegen & Atkinson, 1974). The several articles by McCrae (e.g., 1993–1994; McCrae & Costa, 1985a, 1997) alluding to the nature or essence of what has come to be known as Openness to Experience impress me as extraordinarily apt and enlarging of understanding of the concept. Some individuals are relatively open—behaviorally, perceptually, cognitively; others may not register or be sensitive to openness-eliciting, epiphanic circumstances, to aperçus.

I think it useful to further convey some additional instances of Openness or, as it frequently is alternatively characterized, Absorption. The concept of Openness to experience is uncertainly understood by many and therefore further instances of what so often is felt but not easily verbalized may be useful to many.

But first, a vividly exemplifying instance of Openness: Travelers to France may have seen Picasso’s famous “sculpture,” *Bull’s Head*. Because he immediately visualized or sensed the possibility, Picasso salvaged from a fortuitously encountered scrap heap two items—a discarded bicycle racing seat and discarded bicycle racing handlebars. He spontaneously positioned the inverted handlebars with the racing seat and, lo and behold, this bricolage became a remarkable, widely recognizable, soon-famous simulacrum of a bull’s head. Picasso’s flitting, fleeting attentional engagement exemplifies the remarkable openness of his artistic creativity.

Openness or Absorption less paradigmatically may be felt by an unrestrained, intensified, *impouring* of feeling during perception, thought, or behavior; it facilitates a sudden, intuitive understanding of the meaning or possibilities of something. Certain communal situations or contexts are especially conducive of openness or absorption. Some instances: observing a modern dancer’s fluid and opportune grace; deeply registering a suddenly transfixing poetic line or metaphor or trope; reverential awe when beholding nature (e. g., greenery or vistas or sunsets); the pan-cultural, numinous “rhythm and modes” discerned by Dissanayake in her 2000 book, *Art and Intimacy*; introspections after giving birth or cradling a child one has fathered; the lability and intense perceptions within the mescaline

experience; true empathy (not sympathy) felt with another; the love/sex experience; the reach and touch of art; piquant, nonlinear thinking that may go astray from its “sensible” path; fragile ikebana floral arrangements; the sensuality involved in transforming a lump of clay into a self-made pot; the sheer joy suffusing moments of effective athleticism; the heightened exoticism of foreign travel; creative efforts that anticipate and then fit previously unverbalizable expectations; the absorptions of meditation; the need to add a unique personalizing touch or flair to one’s surroundings—one’s attire, one’s “style,” one’s avocations; the evocative memory of smells arising after a long-delayed rain; the emanation of improvisation in response to sinuous jazz; playful, explorative, ready engagement; unhurried sentience; being captured by the strains and cumulativeness of Beethoven’s Ninth Symphony or a soaring Pavarotti aria. I also note that incidental learning may often also be an aspect or even a fundament of openness to experience.

The experience of Openness or Absorption is perhaps best understood via Mihaly Csikszentmihalyi’s notion of “psychological flow.” Flow, as defined in Wikipedia, “is the mental state of operation in which the person is fully immersed in what he or she is doing by a feeling of energized focus, full involvement, and success in the process of the activity.” Csikszentmihalyi’s work warrants more psychological interest than it has yet received.

Seventh, it seems clear, from an accumulating number of analyses, that the BF are hierarchically subsumed by the higher order, progenitive Big Two factors. Although initially labeled, somewhat vaguely, as *Alpha* and *Beta* because of uncertainty as to what these factors represented, more recently the more specific labels, *Stability* and *Plasticity*, may have gained currency. They are suggested from two rationales. The neural network computer model of Grossberg (1987) argues that an already sufficient (i.e., stable) computer classification system would adaptively fail when it encountered novelty *unless* it was balanced by another system capable of adapting to novelty or further adjusting categories (i.e., being “plastic”). Coming from a quite different but quite complementary direction, Peterson (1999), in a remarkably broad and perceptive volume, proposed and elucidated two functionally analogous, similarly named, *Stability* and *Plasticity* themes as underlying historical and worldwide emergent cultural myths, religions, and the functioning of contemporary societies.

These themes of logic and historical universality have also been recognized by other scholars originating their views from a different standpoint. Cassirer (1944), a well-known philosopher of the last century, made a distinction between “reality” and “possibility.” This polarity between *tradition/stability* versus *innovation/change* can be seen as cognizant of and abstractly

responding to the two essential formal social system requirements for enduring human adaptation. Likewise, the various efforts by political scientists (e.g., Jost, Glaser, Kruglanski, & Sulloway, 2003) to characterize individuals and political entities in terms of their motivational emphases on *preservation versus innovation*, *stability versus change*, *order versus complexity*, *familiarity versus novelty*, *conformity versus creativity* also derives from recognition of the dual necessity of an individual and his or her immediate societal surround attaining and sustaining a stability or order with the complementary need of the individual and his or her societal surround to be able to adapt to change and novelty.

The naming of factors is inevitably a disputatious task. Without fundamentally disagreeing with these most recent higher order factor interpretations, my own psychological background leads me in a somewhat different theoretical (or terminological) direction. I am troubled by the uncertain connotations inherent in the primary, nonprocessual labels offered, *Stability* and *Plasticity*. *Stability* exemplifies societally exemplary behavior necessary and desirable for the continuation of the social order, that is, conventionality. But sometimes, an adaptive mode may go awry. The psychological processes underlying *Stability*—in the extreme—can lead to unyielding, stultifying conformity and constraint in behavior and outlook. *Plasticity* represents engagement, exploration, and adaptation to novelty, that is, individuality. But sometimes, the psychological processes underlying *Plasticity*—in the extreme—can lead to structureless, chaotic reactivity transitorily impinging on behaviors and percepts and cognitions. These “complexified” interpretations proposed as underlying the factors strike me as going well beyond single-word, nonontogenic labels. In addition, a neural modeling formulation conjoined with an illuminating account of the common themes historically underlying mythic narrative strikes me as distant interpretively from immediately close psychological understanding of the complex adaptive system that is personality and personality developments.

Eighth, in my own thinking, the *Stability* and *Plasticity* factor meta-dimensions seem striking manifestations of an early, central developmental process and a subsequent life characteristic. The great Swiss psychologist, Jean Piaget, years ago introduced the concepts of *assimilation* and *accommodation* as fundamental organismic processes in the development of the child. As conceptualized by him, they are the cardinal developmental principles by which the child constructs and reconstructs perceptual and action schemata for behaving adaptively—and achieves equilibration—in the world. Biologically grounded, with extraordinary range, Piaget’s genetic epistemology has transformed our views of psychological development. Widely recognized (if not well understood), the *assimilation* and

*accommodation* concepts are integral to his, and many views. From my own perspective, the renderings in English of Piaget's views have been somewhat clouded, and I have elsewhere attempted a closer view of the dynamic sequencing involved (Block, 1982).

For Piaget (1970), "assimilation is the integration of external elements into evolving or completed structures" (p. 706). Accommodation is "any modification of an assimilatory scheme or structure by the elements it assimilates" (Piaget, 1970, p. 708). Both of these are conceived of as *processes*, not just the static issue of a factor analysis.

Whereas "assimilation is necessary in that it insures continuity and the integration of new elements to these structures" (Piaget, 1970, p. 707), accommodation is necessary to permit structural change, i.e., the transformation of structures is a function of the new elements encountered. Piaget presumes that the organism's neurology has been wired by evolution to bring to equilibrium what is not in equilibrium. It is the work of equilibration to modify or create structures and it is the interplay of assimilation and accommodation that is known as "self-regulation."

I suggest that the concepts, assimilation/accommodation, are inclusive of and more readily system (and connotatively) implicative than the terms, *Stability* and *Plasticity*. The higher order factor labeled *Stability* is equally (I would say, better) seen as expressing *assimilation*, the ingrained tendency to locate new experience in terms of prior organized experience. Likewise, the higher order factor, *Plasticity* may be better recognized as expressing *accommodation*, the evolution-ingrained tendency to reorganize, reconceptualize, and re-equilibrate experience but introducing wider and additional parameters.

*Stability* and *Plasticity*, thought of in neural modeling terms or in culturally mythic terms certainly projects a tenable interpretation. And the neurobiological reasoning conjectured as underlying *Stability* and *Plasticity* is by no means questioned by this contrary interpretation in terms of assimilation/accommodation. But the Piagetian conceptualization may well register and resonate more with the immediate understandings of developmental psychologists. The process of assimilation attempts to conserve individual (and social) structures already evolved in the service of continuing what has already proven to function; the process of accommodation, unfazed by novelty, attempts to incorporate the new into a restructured, further adaptive mode of functioning.

Finally, there needs to be a contemporary reconsideration by personologists of what the study of personality is all or centrally about. At one time, at least as I understood the quest, personality psychology aspired to understanding the dynamics of intraindividual functioning; it was not just the study of individual differences, of which there can be no end. Now, the FFA

studies a restricted version of the panoply of individual differences, providing a factor-analysis based empirical taxonomy. It is not concerned with the variety of life happenings that arise from the dynamic workings of the personality system. What are such dynamic workings?

For example, under certain circumstances, individuals experience anxiety. There are several, specifiable, intrapersonal ways anxiety can come about, and there are several, specifiable, intrapersonal ways anxiety can be lessened. Anxiety can be managed in ways that can be quite different from the way anxiety initially was raised.

## Coda

The understanding of personality, its myriad—even innumerable—characterizations is an unending conceptual task. But also it is an approachable, ever attracting scientific goal. Personologists seek the fundamental parameters of personality, their consequent hierarchical downward relations, and sometimes the lawful connections that become a complex adaptive system. That system—deeply considered—must be evolutionarily suited for life continuance and for constructively adapting to threatening and novel circumstances. We need an adaptive paradigm for this personality *system*, a model or point of view or productive principles that can, in Gell-Mann's memorable and guiding phrase, generate sufficient "surface complexity arising out of deep simplicity." Although we are far from beginning, we have a long way to go.

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