The Five-Factor Model of Personality
THEORETICAL PERSPECTIVES

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CHAPTER TWO

The Language of Personality: Lexical Perspectives on the Five-Factor Model

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In the beginning was the Word. . . .
—THE GOSPEL ACCORDING TO SAINT JOHN

The good Saint did not go back far enough, of course: Before the first word, there had to be something to say. Nonetheless, John's emphasis on semantics foreshadowed some important scientific developments during the 20th century, including the topic of the present chapter—the lexical approach to the representation of phenotypic personality attributes.

Just as humans seem to differ in a nearly infinite number of attributes, personality researchers differ in the *particular* attributes that they find most interesting to study. When questioned about these preferences, many investigators invoke the vague, magical terms "theory" or "theoretical" as their justification, which may mean no more than that someone else has also been interested in the same attribute. For example, why is the attribute called "Openness to Experience" (McCrae & Costa, in press) any more "theoretical" than the attribute "UI(T) 31: Wary Realism" (Cattell, 1957)? What makes the popular twin attributes "Agency" and "Communion" (Bakan, 1966; Wiggins, 1991) more "theoretical" than the attributes "Neuroticism" and "Psychoticism" (Eysenck, 1991)? Indeed, what is there

about the attributes "Ego Resiliency" and "Ego Control" (Block & Block, 1980) that makes them more "theoretical" than "Factor I" and "Factor II" in the Big Five factor structure? If the present authors were in charge of the world, we would ban the use of the term "theoretical" (except perhaps in the title of this volume), in favor of more exact terms such as "premises," "assumptions," and "hypotheses," as well as more meaningful distinctions such as "broad versus narrow" and "phenotypic versus genotypic" attributes. We will make use of these distinctions later in this chapter.

The Lexical Hypothesis

In any large realm, one needs a map, lest one wander in circles forever. Because the realm of human attributes is so immense, a map is all the more crucial. In his *Nicomachean Ethics,* Aristotle attempted to provide such a map for human "character" traits, and since his time, others have tried similar mappings. Until the 20th century, however, none of these psychocartographic attempts met with much success. In hindsight, it is apparent that at least two scientific problems had to be solved first, so as to yield (1) a procedure for *sampling* human attributes and (2) a method for *structuring* that sample of attributes. The 20th century provided some tools for solving both problems, with the formulation of the "lexical hypothesis" and the development of the set of statistical techniques generically referred to as "factor analysis."

Over the years, a number of philosophers and linguists have remarked about the "wisdom" embedded in natural languages. For example, the philosopher J. L. Austin (1957) noted that

> our common stock of words embodies all the distinctions men have found worth drawing, and the connexions they have found worth marking, in the lifetimes of many generations: these surely are likely to be more numerous, more sound, since they have stood up to the long test of the survival of the fittest, and more subtle, at least in all ordinary and reasonably practical matters, than any that you or I are likely to think up in our arm-chairs of an afternoon—the most favored alternative method. (p. 8)

Included within "our common stock of words" are a substantial subset of terms that refer to individual differences. In the late 1920s

and early 1930s, psychologists began to turn to this repository of personality wisdom as a source of the most important phenotypic human attributes (e.g., Klages, 1926; Allport & Odbert, 1936).

The rationale for this lexical hypothesis was well stated by Cattell (1943):

> The position we shall adopt is a very direct one . . . making only the one assumption that all aspects of human personality which are or have been of importance, interest, or utility have already become recorded in the substance of language. For, throughout history, the most fascinating subject of general discourse, and also that in which it has been most vitally necessary to have adequate, representative symbols, has been human behavior. (p. 483)

Cattell (1957) argued: "Over the centuries, by the pressure of urgent necessity, every aspect of one human being's behavior that is likely to affect another has come to be handled by some verbal symbol—at least in any developed modern language. Although some new words for traits constantly appear, a debris of equivalent but obsolete words constantly falls from the language" (p. 71).

Perhaps the most widely quoted explications of the lexical hypothesis are those of Norman (1963):

> Attempts to construct taxonomies of personality characteristics have ordinarily taken as an initial data base some set of perceptible variations in performance and appearance between persons or within individuals over time and varying situations. By far the most general efforts to specify the domain of phenomena on which to base such a system have proceeded from an examination of the natural language. (p. 574)

Norman (1967) argued that a truly comprehensive (or in his words, "exhaustive") taxonomy of personality attributes must take as its fundamental database

> the set of all perceptible variations in performance and appearance between persons or within individuals over time and varying situations that are *of sufficient social significance, of sufficiently widespread occurrence, and of sufficient distinctiveness to have been encoded and retained as a subset of descriptive predicates in the natural language during the course of its development, growth, and refinement.* (p. 2, italics added)

Some recent critics (e.g., Block, 1995) argue for ignoring this natural repository, because it is used by "novices" (i.e., laypersons) in personality description. We take a different view. "Common speech" may be an imperfect "guide to psychological subtleties" (Allport, 1961, p. 356), but it is a powerful guide to salient phenomena that scientists should not ignore. To discard all lay conceptions, besides being unrealistic, "would require us needlessly to separate ourselves from the vast sources of knowledge gained in the course of human history" (Kelley, 1992, p. 22).

Indeed, scientific concepts often evolve from folk concepts (Sternberg, Conway, Ketron, & Bernstein, 1981; Tellegen, 1993). Even as folk concepts such as height, weight, volume, and age provide basic but not exhaustive (necessary but not sufficient) components for a science of physical differences, likewise personality concepts in the natural language provide basic but not exhaustive (necessary but not sufficient) components for a science of personality attributes.

Recent criticisms of the lexical hypothesis (e.g., Block, 1995; McCrae, 1990; Stagner, 1994) reflect an inadequate understanding of the lexical approach. In this chapter, we will try to provide a clarifying perspective. First we will articulate a set of premises that constitute the essence of the lexical perspective; we will try to demonstrate that these premises are in harmony with major criteria for "good science," such as comprehensiveness, parsimony, testability, and evidence of empirical validation. Although we welcome attempts to refute these premises, we believe they are so well grounded as to be difficult to refute. On the other hand, we shall suggest that the lexical perspective has a finite scope, and is not intended to provide a complete or exhaustive "theory of personality."

Along the way, we shall suggest a few refinements of terminology appropriate to the lexical perspective. We turn first to a crucial distinction imported into psychology from biology.

1. *Personality language refers to phenotypes and not genotypes.* The concept of *genotype* refers to underlying (causal) properties, whereas the concept of *phenotype* refers to observable (surface) characteristics. As a rule, observers of personality are not equipped with those devices necessary to observe genotypes. Thus, our perceived personality attributes are phenotypic. Several subtle but important distinctions follow.

First, the language of personality provides a framework for

description, but not necessarily for explanation. A genotype provides an explanation for a phenotype, but a particular phenotype has no necessary implication for a particular genotype; there need be no one-to-one correspondence between phenotypic and genotypic patterns. Phenotypic attributes of personality may be accounted for by genotypic constructs related to nature (e.g., our genetic inheritance), to nurture (e.g., experience, conditioning, social learning, culture), or more likely some combination of genetic and environmental influences. The lexical perspective leads to data that need explaining, not necessarily to the modes of explanation. It "makes no explicit assumptions (or claims) about the ontological status of traits or about the causal origins of the regularities to which they refer" (John & Robins, 1994, p. 138). Because it describes without venturing to explain, the lexical perspective, compared to some other approaches in the study of personality, may be less prone to encourage the "fundamental attribution error" (Ross, 1977) of an irrational preference for dispositional over situational explanations of behavior.

Second, the lexical perspective is not an instance of "trait theory" (Pervin, 1994), although "trait theorists" (if there be such creatures) might profit from attention to the lexical perspective. "Trait theory," a rubric that may have no meaning outside introductory personality texts (Goldberg, 1994), is held to assume that personality characteristics are relatively stable over time and across situations. The lexical perspective itself does not require these assumptions, having no staked-out position on whether the phenotypic attributes encoded in language are verifiably stable.

Third, those phenotypic personality characteristics upon which the lexical perspective focuses are really better described as "attributes" than as "traits." Like an awkward tourist in an unfamiliar land, the word "trait" carries too much baggage into studies of phenotypic personality language. "Trait" is a term used to describe genotypes as well as phenotypes (e.g., "sickle-cell trait"), and was used by Allport (1937) to denote a "bona fide mental structure" that explained behavior (p. 289). Moreover, calling a characteristic a "trait" already implies that the characteristic is stable, which is a matter for empirical verification, rather than a priori presumption. A model of attributes should not be equated with a model of traits (Goldberg, 1993a). The use of "attribute" makes a clearer reference to phenotype, without any implications about the stability of that phenotype, and without unnecessary implications as to genotype.

2. *Phenotypic attributes are encoded in the natural language.* This proposition is the first part of the lexical hypothesis. The phenotypic attributes worth noticing become encoded in language as a word for the attribute appears and is maintained by frequent use. In this respect, language comes to reflect our knowledge of the world, and indeed, language is the prime medium through which we come to "know" personality.

Of course, we need not presume simplistically that this encoding is literal and exact, with exactly one word for one attribute or vice versa, because neither attributes nor words can be assumed to have a discrete, nongraded structure. The meaning of a new word must be defined relative to the rest of the semantic field, and it is likely to include not only synonymy and contrast, but also uniqueness. We can ask of a new word: What new facet of description does it add; to apply a psychometric simile, what is its "discriminant validity"?

As a result of the inevitable interrelations between our language and our understanding of personality, the concepts in everyday use to categorize human actions and practices form a substantial part of the subject matter of personality psychology. The scientific study of personality, even if it reveals errors in lay use of these concepts, will always have to relate back to such folk concepts (Hampson, 1994).

3. *The degree of representation of an attribute in language has some correspondence with the general importance of the attribute.* This proposition is the second part of the lexical hypothesis, and it can be stated in two forms. First is an across-language form: "The more important is an individual difference in human transactions, the more languages will have a term for it" (Goldberg, 1981, p. 142). Second is a within-language form: The more important is such an attribute, the more synonyms and subtly distinctive facets of the attribute will be found *within any one language,* a conjecture proposed by the linguist Zipf (1949). As implied by either form, the lexical perspective entails an indigenous or "emic" research strategy; analyses are carried out separately within each language, without the importation of translated or "etic" selections of variables from some other language.

Thus, the most important phenotypic personality attributes should have a corresponding term in virtually every language. Moreover, in those languages with a rich personality vocabulary, such an attribute will be referenced by some discernible "associative constellation" (Saussure, 1983; p. 174), a dense cluster of loosely synonymous terms. When used in ratings of oneself or others, these terms

will be highly intercorrelated and therefore, along with their antonyms, they will tend to define a semantic "factor." Of course, these synonym clusters are not simply redundant reexpressions for the same attribute, but rather bundles of related concepts likely to have a family-resemblance structure (Rosch & Mervis, 1975; Wittgenstein, 1953).

In short, we assume a correspondence between lexical representation and substantive importance. This premise is in keeping with the common assumption among linguists that reference stems from word–object contiguities in experience. Because we typically learn the meaning of a new word by matching it to some object in our experience to which it is applied, those words in frequent use tend to be those frequently judged as applicable to real-life objects (e.g., persons). Although trivial or illusory attributes might become encoded in language, they are less likely to prove useful across associations with many objects (e.g., persons).

However, the correspondence between lexical representation and substantive importance should not be magnified into a "naive realism," in which mental experiences (including words for attributes) are assumed to map precisely the real features of personality and, therefore, because there is a word for an attribute, it must be a real and important one. Nor should this correspondence be diminished by invoking a strong form of linguistic relativity (Whorf, 1956), in which language is assumed to determine perception and, therefore, personality is assumed to exist only in language.

Rather, we propose a moderate "realism." Because the relation between the lexicon and the real world is mediated by those concepts that are expressed as words, and by any potential distorting effects of their perception, the relation is indirect. Lexical representation is not a pure reflection of objective reality, but in cases in which lexical representation is very prominent (such as a large cluster of related words in a language with a large lexicon, or a frequently used word in a language with a small lexicon) the likelihood of objective, real-world reference is very high.

By this logic, the lexical approach should not be extended beyond the identification of those semantic patterns that are heavily emphasized in language. The significance of one isolated personality adjective in a large-lexicon language such as English is very limited, and the extension of the lexical approach to identifying extremely fine-grained, narrow facets of large factors violates the key premise of the approach. Aggregates of words are more significant than isolated

words, and familiar and frequently used words are more significant than unfamiliar and infrequently used words.[1]

Given the premise that lexical representation has some correspondence with substantive importance, another proposition logically follows.

4. *The lexical perspective provides an unusually strong rationale for the selection of variables in personality research.* Biased selection of variables is a ubiquitous threat to the validity of personality research. Even as the language can generate an infinite number of distinct sentences (Chomsky, 1957), a virtually infinite number of sentence-length questionnaire items pertinent to personality can be constructed. With so many potential variables, one does not know when one is using a biased selection. In contrast, there is an essentially finite number of single terms that refer to personality in any language, so better grounds might be established for a relatively nonbiased selection from a large set of personality descriptors. In consequence, with natural-language personality-descriptive terms, one can argue that a selection of variables is actually representative of some larger population of variables (cf. Peabody, 1987); such arguments could prove important in defining the content validity of personality measures.

Of course, the population of variables defined by familiar person-descriptive terms may not be the optimal population of variables for all seasons and situations. For example, the hypothetical population of expert-conceived personality variables will likely be somewhat different (cf. Block, 1995), even if there is considerable overlap. Nonetheless, the population of variables defined by the lexical perspective has the advantage of being little affected by short-term intellectual fads and fashions. Although faddish terms appear and disappear on the surface of the semantic field within decades, the overall framework of language is comparatively conservative and slow-changing, and most personality terms have been used in a recognizably similar way for centuries.[2]

With a relatively unbiased selection of variables, an investigator minimizes prestructuring data that would otherwise produce a facile "confirmation" of prior expectations. As is now well known, research findings depend on the particular set of variables that an investigator chooses to include and exclude. The literature in personality psychology is replete with reports from well-intentioned investigators who have repeatedly "confirmed" their preferred models, using their preferred selection of variables; these investigators are frequently

puzzled and frustrated when others, using other selections of variables, remain unconvinced. Bolstered by the trend in human nature toward confirmation of prior expectations, arbitrary variable-selection procedures contribute to the dissonance in personality research. The lexical approach, in contrast, is surely the single approach in personality psychology that best minimizes prestructuring, since the all-important step of variable selection can be taken out of the investigator's hands and delegated instead to dictionaries or aggregated raters (Goldberg & Saucier, 1995). In this respect, the lexical perspective offers one corrective to the encroachment of anchoring effects (Tversky & Kahneman, 1974) and confirmation bias (Einhorn & Hogarth, 1978) into the science of personality.

However, in order to specify a population of lexical variables, one must confront a few difficult issues. First, not all person-descriptive terms would satisfy everyone's criteria for being "personality" relevant. Investigators with narrow definitions of the concept of personality might well choose to exclude physical descriptors (e.g., *tall*), appearance descriptors (e.g., *good-looking*), primarily evaluative terms (e.g., *excellent*), and descriptors of social roles (e.g., *professional*), social effects (e.g., *popular*), or temporary states (e.g., *embarrassed*). Because most of these categories have no clear boundaries separating them from the category of personality attributes (Chaplin, John, & Goldberg, 1988), inclusion and exclusion criteria must be developed to specify the subpopulation of lexical personality variables within the larger population of lexicalized person-descriptors. Investigations are needed to discover the effects of differing variable-inclusion criteria on the resulting lexical findings.

Second, the English language contains many terms whose use in person-description is ambiguous or metaphorical (e.g., *elliptical, snaky, stygian*) and many terms that are obscure and difficult (e.g., *clavering, gnathonic, theromorphic*). It is usually assumed that the meanings of such terms overlap with the set of those that are more commonly used, and therefore they are systematically omitted from most analyses. On the other hand, if one questions this assumption, one might test it by providing dictionary definitions of all terms (Goldberg & Kilkowski, 1985).

Third, person-description employs different parts of speech, including nouns (e.g., "*He's a maverick*"; "*She's a jewel*") and verbs (e.g., "*She often argues*"; "*He never gossips*"), as well as adjectives. Moreover, some languages have few or even no adjectives (Dixon, 1977). On which parts of speech ought we to concentrate?

5. *Person-description and the sedimentation of important differences in language both work primarily through the adjective function.* Dixon (1977) pointed out that, although the word classes noun and verb appear to be universal (cf. Croft, 1991), a number of languages (e.g., Hausa, Telugu) have very few adjectives in general and none referring to human propensities. Moreover, one can find languages (e.g., Yurok) with no adjectives at all. However, Dixon found "adjectival concepts" in all of the languages he surveyed; such terms (1) describe "some important but noncriterial property of an object" and (2) "distinguish between two members of the same species that are described by a single common noun" (p. 63). Similarly, dictionary definitions of "adjective" include its use as (1) a modifier of nouns to denote a quality of the thing named and (2) the designation of a particular thing as distinct from something else. Wierzbicka (1986) has identified the adjective, where such a class does appear, with the denotation of single properties that can be applied to a broad range of entities, in varying degrees or amounts (e.g., *bold, bolder, boldest*). Adjectives attribute qualities or properties, whereas nouns categorize and make reference to objects or events, and verbs identify processes, such as motion, vision, communication, and possession (Miller & Johnson-Laird, 1976).

In some languages (e.g., Dyirbal), this adjective function is carried out entirely through adjectives, whereas in others, the function may be carried out mostly through nouns or verbs. English, like other Indo-European languages, appears to fall between these extremes; it has a very large adjective class, but the adjective function is sometimes carried out through nouns and verbs. When one says "He is a maverick" or "She often argues," one is both (1) describing non-criterial properties of an object (i.e., a person) and (2) distinguishing between members of the same species. Thus, one is carrying out an adjective function through a noun or through a verb. The concept of "adjective function" helps account for differences between nouns that represent a kind of entity combining many features (e.g., *child, woman*) and nouns that serve to identify a single property (e.g., *liar, birdbrain*) and thus function more like adjectives (Wierzbicka, 1986).[3] Evidence cited by Dixon (1977) indicates that, across languages, the adjective function of describing human propensities is more often taken over by nouns, especially abstract attribute nouns (e.g., *skill, generosity*), than by verbs.

Based on such evidence, we propose that adjectives are the prototypical and central repositories of the sedimentation of important individual differences into the natural language. Person-description, as a description of the qualities and characteristics of an object, is inherently an adjective function, although it can be carried out using other word classes. Therefore, the lexical perspective on personality is properly focused on the adjective function. In most languages, this perspective will be adjective-centered, but lexical researchers need to be alert to potential variations: The adjective function of describing kinds of individual differences in certain languages may operate largely through nouns or even verbs.

In most Indo-European languages, and almost certainly in English, personality descriptions found in formal written discourse include far more adjectives than nouns, whereas personality-type nouns are used mostly in informal contexts, especially in spoken conversation. English type nouns tend to be evaluatively more highly polarized than adjectives (e.g., *saint, devil*); unlike adjectives, such nouns most frequently refer to undesirable attributes (e.g., *jerk, bozo*); and many of them are slang expressions that pop into and out of contemporary discourse far more rapidly than adjectives. We assume that the range of attributes incorporated in the total set of personality-type nouns (not to mention personality-attribute nouns) overlaps largely with that of adjectives, a conjecture that we are now subjecting to empirical test.

Personality-relevant verbs present much greater difficulties. The personality implications of most transitive verbs are prohibitively ambiguous, without clarifying the object of the verb (e.g., *enjoys* compared to the far less ambiguous *enjoys life,* or *enjoys loud parties,* or *enjoys violence*). Moreover, some of the most common verbs (e.g., *comes, goes*) are "deictic," or only ambiguously interpretable without "knowledge of the context in which the communication occurs" (Miller & Johnson-Laird, 1976, p. 395). Indeed, Miller and Johnson-Laird attempted an extensive psycholinguistic analysis of English verbs in terms of their implications for understanding human cognition, but they concluded that verbs have complex interrelations, often lying at the intersections of semantic fields. Similarly, other investigators have noted that verbs appear to form associations with members of other word classes more readily than with one another (Deese, 1965), and verbs seem to be organized into much looser associational networks than are adjectives and nouns (Kiss, 1973). As a consequence, we question the usefulness of including most classes of uncontextualized verbs as stimuli for person-descriptions.[4]

6. *The structure of person-descriptions in phrases and sentences is closely related to that based on single words.* One critique sometimes made of the lexical perspective concerns its focus on single, isolated words. For example, McCrae (1990) argued that the allegedly fundamental dimension of Openness to Experience has very few corresponding adjectives in English, a conclusion that was later questioned by Saucier (1992b). If McCrae is correct, and therefore it is necessary to use phrases, sentences, paragraphs, and technical jargon to describe an allegedly fundamental attribute, perhaps there is something wrong with the use of single terms to study the structure of personality attributes.

We acknowledge that finer and subtler thoughts can be expressed in phrases, sentences, and paragraphs (not to mention technical jargon) than in single words. We acknowledge also that personality measurement must avail itself of such nuanced syntactical constructions in order to measure many significant variables reliably. However, in defining the universe of personality-related attributes, single-word descriptors expressing the adjective function have a clear advantage for several reasons. First, the fundamental lexical hypothesis is focused on words, not on sentences. Second, these single-word descriptors comprise an essentially finite domain, offering an unusually powerful rationale for variable selection. Third, the contrast between single adjectives and questionnaire sentences is easily overstated, when, in fact, the syntax of personality-questionnaire items is typically not complex. For example, on the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992), dozens of items are simply person-descriptive adjectives preceded by such phrases as "I am," "I am not," "I sometimes (or often or rarely) feel," and "I am known to be." Indeed, that 240-item inventory includes at least 110 personality adjectives, as well as at least 19 attribute nouns, 4 type nouns, and 3 adverbs constructed from adjectives. Nor is that inventory atypical; many questionnaire items include personality-descriptive adjectives. As a consequence, the deep structure of single terms and of more complex statements may be far more similar than their surface appearances would suggest.

Moreover, research on language suggests that single terms often function holophrastically; that is, they can incorporate complex ideas that are normally expressed in sentences (Macnamara, 1972; Paivio & Begg, 1981). For example, in the telegraphic and holophrastic speech of 2-year-olds, adults can typically infer full-sentence meanings (e.g., "Candy" meaning "I want some candy") and similarly infer meanings

from the holophrastic speech of other adults (e.g., "Good" meaning "That is good"). When subjects describe a target using a list of adjectives, their instructions prime them to generate certain implied sentences (e.g., "Courageous" meaning "I am typically courageous"), in effect controlling for conditionals, contextualizations, and specifications.

Indeed, one can best understand the language of personality as a semantic hierarchy consisting of words and phrases at different levels of abstraction versus specification (John, Hampson, & Goldberg, 1991). At the highest level is pure evaluation (*good* vs. *bad*), which can be indexed by some linear composite of Big Five Factors II, III, IV, and V—Factor I being reasonably neutral on the evaluation continuum (Saucier, 1992a, 1994c). At a lower level, but still way up in the stratosphere, are the broad Big Five domains themselves, with the 90 facets of the AB5C model (Hofstee, De Raad, & Goldberg, 1992) located below them. Still quite abstract, but lower in the hierarchy, are all of the single personality descriptors, which in turn can be ordered by their breadth (Hampson, John, & Goldberg, 1986). Each of these single terms (e.g., *extraverted*) can be specified, conditionalized, or contextualized in a host of ways (e.g., *likes to tell jokes at parties*), and it is these myriad specifications that form the basic building blocks of most personality scales and inventories. When viewed in this hierarchical fashion, it is not surprising that analyses of large numbers of diverse personality scales appear to generate much the same factor structure as those based on the higher level single terms.

7. *The science of personality differs from other disciplines in ways that make the lexical perspective particularly germane in this scientific context, yet not in others.* By far the most common criticism of the lexical perspective on personality attributes is of the form: "Imagine how primitive would be the science of physics, chemistry, physiology, or . . . (fill in the blank) if that discipline had restricted its constructs to those found in the natural language." This form of reasoning by analogy might be appropriate if the disciplines being compared were similar in their self-referential nature. However, unlike physics, chemistry, physiology, or . . . (fill in the blank), person judgments are central to the science of personality; our perceptions of ourselves and others form an integral component of the phenomena to be explained by our scientific discipline. Moreover, language serves two functions in this regard: (1) It serves as the only repository of the set of perceptible

individual differences "that are of sufficient social significance, of sufficiently widespread occurrence, and of sufficient distinctiveness" (Norman, 1967, p. 2) to be retained in our collective memory; and (2) language also later serves to constrain our descriptions, if not to some extent our very perceptions, by providing the semantic units necessary for communication to occur.

Said another way, atoms, chemical elements, stars, bodily organs, trees, and other natural objects do not communicate with each other through the medium of language—if they did, you can bet that scientists would want to study their emic, language-based conceptions. Indeed, some of the most fascinating research on animal behavior has focused on communication among primates. However, humans appear to communicate through a uniquely complex language system, a system that acts like a sieve, filtering out concepts that are not of widespread utility, and retaining concepts that are. In the case of personality, those concepts serve to define the core architecture of our discipline. Rarely in the physical and natural sciences can this be said to be true.

The science of personality has as its subject of study socially meaningful behavior patterns; because they are socially meaningful and are interwoven with social action, these patterns are abundantly represented in language. Operational definitions of personality concepts (e.g., *Neuroticism* and *Openness* as scientific constructs) cannot stray far from those definitions collectively represented in the language (e.g., the generally understandable meanings of *neurotic* and *open*), lest they become confusing and useless, and thus inapplicable and ungeneralizable to everyday life.

Although the lexical perspective implies that important individual differences become "socially represented" in language, this social representation in no way implies that these differences are "socially constructed." Again, the lexical perspective suggests that the descriptive classification latent in language partially reflects knowledge of the real extralinguistic world, implying that language has woven into it the world of real human action (cf. Wittgenstein, 1953). Like behavior genetics or ethology, social constructionism is an explanatory approach, whereas the lexical perspective is a purely descriptive one. As Greenwood (1991) points out, "Classificatory descriptions of human actions in terms of social relations and representations are quite *neutral* with respect to explanatory questions" (p. 28). And for all its concern with folk *classifications,* the lexical perspective is in no way committed to folk-psychological causal explanations. The lexical perspective generates a descriptive classification, with no implications as to what conditions enable or influence the characteristics so classified.

8. *The most important dimensions in aggregated personality judgments are the most invariant and universal dimensions—those that replicate across samples of subjects, targets of description, and variations in analytic procedures, as well as across languages.* The lexical perspective can be employed to locate patterns of person perception idiosyncratic to certain types of samples, targets of description, and languages. Of even greater importance, however, the lexical perspective, in line with the scientific goals of comprehensiveness, parsimony, and predictable replication, can be directed toward the discovery of universals. If a personality factor is found only in a certain kind of sample (e.g., men, women, students, children) or in descriptions of a certain kind of target (e.g., self, friend, spouse, child, parent), that attribute would appear less basic than those that replicate across samples and targets. The idiographic pattern is best illuminated by the nomothetic trend.

Moreover, when factor analysis is employed to reduce lexical data to a few parsimonious latent variables, the best solutions are those that are relatively invariant to the procedures used for factor extraction or rotation, at least within the range of reasonably well-accepted methods. A robust and replicable factor solution is one that is so clear and strong that the choice of analytic method becomes unimportant. And because exploratory factor analysis provides a more rigorous replication test than confirmatory analysis, the former technique may often be preferred to the latter. This means that no single analysis is powerful enough to provide evidence of the viability of a factor structure; one needs a number of analyses of at least somewhat different variables in different subject samples. For a more detailed discussion of these principles, see Goldberg and Digman (1994).[5]

Employing the rationale of the lexical perspective, it might be possible to identify a set of universal factors in personality description, that is, relatively invariant factors generated from independent emic studies in many languages (Goldberg, 1981). Of course, the lexical perspective does not necessarily require this hypothesis; it is possible that individual differences are so strongly moderated by culture that no universal lexical dimensions will ever be found.

The hypothesis of universal lexical dimensions includes two separate assumptions. The first concerns the broad dimensionality

of the personality attribute space, whereas the second concerns the exact locations of the factor axes within that space. To the extent to which most person descriptors are inherently multidimensional, each a blend of two or more different personality aspects or components, then it is extremely unlikely that factors derived from analyses of different languages will all be found in precisely the same locations, even if the broad dimensionality of the representations turns out to be the same. Rather, one would assume that even small differences between languages in the relative frequencies of terms for particular attributes would inevitably lead to somewhat different factor locations.

One solution to the always somewhat arbitrary problem of factor locations is to accept attribute multidimensionality as a given and to represent the attribute space as a hypersphere, which can be reduced for many purposes to a set of circular structures (e.g., Hofstee et al., 1992). To compare languages, however, it would still be useful to provide some reasonable candidate locations for the reference axes so that different analyses both within and across languages can be sensibly compared. Such special locations can be thought of as orientation guides, such as are provided by the (reasonable yet somewhat arbitrary) polar coordinates by which we circumnavigate the earth.

A considerable body of research has generated a very promising candidate to fill the role of a set of "reasonable locations" for possible universal lexical dimensions—the Big Five factor structure (Goldberg, 1993c). We will now discuss some features of this structure, with the expectation that these features are likely to apply to any set of universal lexical dimensions. To distinguish these generalizations, many of them empirically derived, from the earlier lexical premises, we order them in a separate sequence.

The Big Five Factor Structure

A. *The Big Five personality factors appear to provide a set of highly replicable dimensions that parsimoniously and comprehensively describe most phenotypic individual differences.* To date, research informed by the lexical perspective tends to confirm that personality attributes can be represented at an abstract level, with considerable comprehensiveness and great parsimony, by five broad dimensions. The Big Five

have been isolated in relatively similar form in lexical studies of American English (Goldberg, 1990), Dutch (Hofstee & De Raad, 1991), and German (Ostendorf, 1990). Studies are currently under way in languages as diverse as Hungarian, Italian, Czech, Polish, Russian, Tagalog, and Japanese to test the generalization of this five-factor structure to independent personality-related lexicons in non-Germanic languages.

The Big Five model has been distinguished from the five-factor model (FFM) by John and Robins (1993). The Big Five model, which has been derived from lexical data, is a model of personality *attributes* and is therefore descriptive rather than explanatory. Moreover, the Big Five model entails rigorous cross-language replication tests.[6] In contrast, the FFM includes a dispositionalist explanatory hypothesis that the five factors correspond to biological traits ("endogenous basic tendencies"; McCrae & Costa, Chapter 3, this volume). The FFM is based in part on the findings from cluster analyses of the 16 PF (Costa & McCrae, 1976) and in part on two additional dimensions taken directly from the lexically based Big Five model. Research on the FFM has centered on personality questionnaires anchored in English. Although the two models are similar in many respects, they should not be confused.

B. *Given the variety of conceivable exclusion criteria for defining personality attributes, the Big Five are meaningful at all levels, but more comprehensive and parsimonious under narrower definitions of personality.* Allport (1937) has provided a classic discussion of the lack of consensus in defining the meaning of the concept of "personality." Even today, there is still a lack of consensus in what is included as "personality" and what is not. For example, the Dutch lexical team (Brokken, 1978) selected personality terms by means of judgments of their fit into two target sentences: (1) "He or she is . . . by nature" and (2) "He or she is a . . . kind of person." Using the average ratings across both sentence frames, and excluding those terms with average ratings in the lower half of the distribution of all Dutch personality terms, they emerged with an item pool that included primarily terms for stable traits, and that excluded most terms referring to talents and capacities. In contrast, the German lexical team (Angleitner, Ostendorf, & John, 1990), profiting from the experiences of the Dutch, explicitly included terms relating to intellect. The American-English investigators (Norman, 1967; Goldberg, 1982) not only included terms relating to intelligence and other talents, but also included some terms

excluded as "attitudes and worldviews" or as "temporary states" by the other two teams. Although none of the three teams included "purely evaluative" and "social effects" terms, Tellegen and Waller (1987) and Waller (in press) have recently argued in favor of including *all* trait, state, attitude, and evaluation terms in lexical analyses. Given that stable traits might be central aspects of the concept of personality, it is clear that there is a graded continuum from terms denoting stable attributes of temperament into those describing temporary states and into those relating to social effects and evaluations, with no clear line of demarcation (Chaplin et al., 1988).

Inasmuch as the Dutch, German, and American teams, despite their differences in exclusion criteria, found a reasonably convergent five-factor structure, it might be provisionally concluded that such differences have relatively few consequences for factor structures. However, such a conclusion would be premature. In our view, the inclusion of large numbers of terms relating to attitudes and worldviews,[7] or terms denoting physical characteristics, could result in additional factors, whereas the inclusion of large numbers of evaluation terms is likely to affect the positions of the rotated factors. Any evaluation term has some (at least small) descriptive reference, so there may be no completely "pure" evaluation terms. A large number of so-called evaluation terms (e.g., *cruel, wicked*) are actually markers of the negative pole of Big Five Factor II (Agreeableness) in ratings of both self and peers (Saucier, 1994a). Many positive evaluation terms may shift semantic reference according to the type of target. For example, the terms *excellent* and *impressive* in self-ratings might signify narcissism, self- esteem, or personal accomplishment, but in ratings of other people, these terms are more likely to signify likability and prosocial attributes (Saucier, 1994b). As long as we accept the usefulness of both types of targets, such evaluation terms will carry with them considerable descriptive ambiguity.

Existing evidence suggests that the Big Five factors will more likely be verified in data sets using narrower rather than broader criteria for the inclusion of attributes. Because "personality" is so hard to define clearly, the broader criteria are not necessarily invalid. Accordingly, the present Big Five structure ought to be considered as an initial approximation (but probably the central hub) of a future model based on a wider array of lexical evidence. Moreover, there is always the yet-untested possibility that some factors beyond the Big Five might be found in analyses of type nouns, attribute nouns, or personality-relevant verbs (cf. De Raad & Hofstee, 1993; De Raad & Hoskens, 1990; De Raad, Mulder, Kloosterman, & Hofstee, 1988).

In summary, then, the Big Five appears to provide a comprehensive organizing structure for most personality attributes, but the comprehensiveness is not perfect. Clearly, there could be additional dimensions beyond the Big Five. Even in data sets based on adjectives chosen by relatively narrow inclusion criteria, we have isolated a few small outlier dimensions, such as Religiousness, Culture, Prejudice, and Sensuality. These additional dimensions have *far* fewer adjectives defining them, and thus the lexical hypothesis would suggest that they are less important. Nonetheless, we can expect to observe some other outlier dimensions in the future, found either among typical personality adjectives, or in data sets including state or evaluation or social-effect adjectives, or among nouns or verbs performing an adjective function. Some may be unique to a language, population, or type of target. Others might prove to be universal.

C. *The Big Five factors are not necessarily of equal importance and replicability.* The FFM, in many ways parallel to the Big Five model, is often presented as if the five factors were equal in their importance and replicability. But the Big Five model is based on the lexical hypothesis, which provides a rationale for assigning differential importance to one factor or another based on its salience in the natural language. Accordingly, from the lexical perspective, the relative importance of the Big Five factors is an open question.

All of the five factors appear to be remarkably robust by general standards, so it has been relatively easy to proceed as if the five were equal in importance. However, evidence to date suggests that the first three factors (Extraversion, Agreeableness, and Conscientiousness) are typically more easily replicable than the latter two (Emotional Stability and Intellect or Imagination) (Saucier, 1995). And, when one moves from ratings of an evaluatively homogeneous group of targets such as one's close friends to (1) ratings of an evaluatively heterogeneous group of targets, or (2) judgments of the semantic relations among personality attributes, the first three factors become increasingly large relative to the other two (Peabody & Goldberg, 1989). Moreover, as one reduces the number of factors that are rotated to three, one continues to find these first three factors (Goldberg & Rosolack, 1994; Saucier, 1995).

There are a number of reasons for these findings. First of all, there are substantially more English adjectives associated with each of

the first three factors than with either of the latter two (Goldberg, 1990). Perhaps, as a consequence, it is easier to find large homogeneous sets of factor markers for the first three factors than for the last two (Goldberg, 1992; Saucier, 1994a). And, the fifth lexical factor (Factor V: Intellect), with the least impressive replication record (cf. Szirmak & De Raad, 1994), appears to be the weakest of the five; initial results from studies of one non-Indo-European language (De Raad & Szirmak, 1994) indicate that it may be necessary to rotate a sixth factor in order to arrive at a clearly represented "Intellect" factor.

McCrae and John (1992) have advocated labeling the five factors by their initials (*E, A, C, N,* and *O*) because of the easy interpretability and high mnemonic value of letters as compared to numbers. This suggestion could lead others to assume that the Big Five are equal in importance and replicability. However, the Roman numerals for the Big Five assigned by Norman (1963) correspond roughly to the order in which they are represented among common English trait terms (cf. Peabody & Goldberg, 1989). It may be no accident that the factor whose replicability is the subject of the greatest controversy is labeled Factor V, the last factor. The retention of the Roman numerals as labels is sensible from the standpoint of the lexical perspective, unless and until evidence indicates no parallel between primacy of numbering and either importance or replicability.

Finally, there is no basis for an arbitrary a priori assumption that the Big Five factors each have the same number of specific "facets." One might suppose that larger and more important factors would include more subordinate facets, but this is still an open question.

D. *The Big Five do not form tight and discrete clusters of variables; rather, as a general rule, each factor represents a major concentration in a continuous distribution of attributes in descriptive space.* As is well known, human perception both of colors and emotions includes not only basic or primary attributes, but also blends of these attributes. Personality description appears to follow suit. For example, Saucier (1992a) and Hofstee et al. (1992) showed that most personality-attribute terms do not relate in a simple manner to only one Big Five factor, but rather correlate substantially with combinations (typically a pair) of factors; that is, personality descriptors are not organized neatly into tight and discrete clusters of variables. Instead, most variables fall in the interstitial areas between the factor poles.

This proclivity to form blends appears to be especially characteristic of Big Five Factors I, II, and IV, moderately characteristic of Factor III, and only weakly characteristic of Factor V, which does not seem to "blend" as easily with the others (Saucier, 1992a); that is, with Factor V one finds fewer variables in the interstitial areas of the two-factor planes (Hofstee et al., 1992); this finding might provide further grounds for regarding the fifth factor in a somewhat different light than the first four.

E. *A complete taxonomy of personality attributes must include both horizontal and vertical features of their meanings.* The horizontal aspect refers to the degree of similarity among attributes at the same hierarchical level (e.g., *humility* involves aspects of both *timidity* and *cooperativeness*). The vertical aspect refers to the hierarchical relations among attributes (e.g., *reliability* is a more abstract and general concept than *punctuality*). It is necessary to think hierarchically about the use of trait measures in applied contexts, but it is equally necessary to think horizontally about basic taxonomic issues (Goldberg, 1993b). Clear hierarchical (vertical) relations between attributes are easy to distinguish for only some of the attributes encoded in the natural language (Hampson et al., 1986; John et al., 1991), whereas horizontal relations are clearly important for a majority of them (cf. Hofstee et al., 1992). The structure of personality attributes is to some degree hierarchical, but to a substantial degree "heterarchical," much like the spectrum of light as it is displayed on a color wheel.

The replication of facets of personality description at a more specific hierarchical level than the Big Five is a daunting task. Between-language differences, the difficulties of translation, and the lack of any clearly agreed-upon methodology for identifying such facets all pose obstacles, but this is an important problem for future research.

F. *Rather than the final chapter for personality research, the Big Five is but an important beginning.* In the face of a growing consensus on the adequacy of the Big Five as an organizing representation for personality attributes, a number of personality researchers of diverse persuasions (e.g., Block, 1995; Paunonen, 1993; Shadel & Cervone, 1993) seem to have reacted defensively to a presumed reduction of all personality research to the Big Five. We hope we can help them breathe a little easier.

The Big Five model does not define any limits for personality research. Rather, the research leading to the Big Five structure simply

constitutes a body of findings too powerful and crucial to be ignored by anyone who seeks to understand human personality. In taking account of this body of findings, it is likely, and appropriate, that the Big Five will be incorporated into a variety of theoretical perspectives (e.g., Buss, Chapter 6, this volume; Tellegen, 1993; Wiggins & Trapnell, in press). The Big Five model is not a threat to other research traditions so much as important information for scientists to utilize. We believe that more than one view can illuminate a subject matter (Shweder, 1989), and that "no doors should be closed in the study of personality" (Allport, 1946, pp. 133–134). We can be more specific about some doors that clearly should be left open.

G. *As a representation of phenotypes based on the natural language, the Big Five structure is indifferent and thus complementary to genotypic representations of causes, motivations, and internal personality dynamics.* The Big Five are dimensions of *perceived* personality. These natural-language dimensions roughly parallel those proposed as a causal model of personality structure by McCrae and Costa (Chapter 3, this volume). This general confluence of everyday person-perception and the constructs in an expert-defined system underlines points we have made earlier: As is the case for physical differences, the natural language is a useful starting point for scientific research on psychological differences; indeed, many other technical classifications have developed from vernacular ones (Simpson, 1961). Personality measurement is unlikely ever to become totally divorced from socially meaningful folk concepts. Nonetheless, folk concepts can be distinguished from formal psychological concepts, even when the latter are relatively close to the former (Tellegen, 1993).

As stated initially by Norman (1963), "It is explicitly *not* assumed that complete theories of personality will simply emerge automatically from such taxonomic efforts. . . . There is a good deal more to theory construction and refinement than the development of an observation language—even a good one" (p. 574). And, as noted more recently by Ozer and Reise (1994), the Big Five model "provides a useful taxonomy, a hierarchical coordinate system, for mapping personality variables. The model is not a theory; it organizes phenomena to be explained by theory" (pp. 360–361).

Delineating the structure of personality attributes is a considerable accomplishment, but this structure implies little about internal personality dynamics or about underlying motivations. Optimally, such dynamics and motivations should be articulated with the Big Five model, and their understanding may be informed by it, but they

are in no way determined by it. A point made earlier bears repeating: A model of attributes should not be confused with a model of causal traits. The Big Five is a descriptive rather than an explanatory model. Thus, doors should be left open for explanatory models of all varieties.

Moreover, the Big Five model, like the lexical perspective from which it springs, relies on the person-perception expertise of aggregates of laypersons. As Block (1995) has pointed out, there are other grounds for expertise. Clinicians, teachers, probation officers, scholars of personality psychology—any of these groups could arguably be better judges of personality structure and dynamics than the aggregate layperson, and their perceptions might go well outside and beyond the Big Five model. The lexical perspective and the Big Five model are not inherently incompatible with any of these concerns and perspectives. The lexical perspective can be considered a complement rather than a competitor to other productive streams of personality research. Perhaps one day all the streams may run together into a complete scientific model of personality, but that day is not yet at hand.

In the interim, those who would ignore the contribution already being made by the lexical perspective do so at their own peril. Ozer and Reise (1994) warn us: "Personality psychologists who continue to employ their preferred measure without locating it within the five-factor model can only be likened to geographers who issue reports of new lands but refuse to locate them on a map for others to find" (p. 361).

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Notes

1. Although assumed to be only moderate rather than perfect, the correspondence between lexical representation and substantive importance is the linchpin of the lexical hypothesis, so it is important to consider how it might be shown to be wrong. Relevant would be any investigation that

identifies a broad major personality distinction that has little or no lexical representation, or—even more powerful—any investigation indicating that a lexically emphasized distinction is of no real importance outside language. Also relevant would be any investigation indicating the failure of a previous application of the lexical rationale. For example, Miller and Johnson-Laird (1976) analyzed the semantic properties of verbs and prepositions and identified as psychologically important the following features that are implicit in the lexicon: (1) three-dimensional spatial understanding; (2) a spatialized comprehension of time; (3) among the human senses a central role for vision and a peripheral role for smell and taste; and (4) movement, possession, sensing, and saying as key processes in human life. Could such conclusions be overturned? Probably not without great difficulty. An easier, but less ambitious test of the hypothesis would be an investigation of gross historical changes in the lexicon, as related to important historical changes in human life as recognized through other data sources.

2. One way to index the diachronic life of a descriptive term is by reference to a dictionary of word histories. From the entries in Barnhart (1988) indicating the first-referenced year of their use as person descriptors, it is apparent that a majority of a large set of common personality-related adjectives have seen use in person description for at least 400 years.

3. The difference between nouns denoting objects and nouns identifying single properties is readily illustrated: "The liar lives in the house next door" sounds more awkward than "The man who lives next door is a liar"; the reason is that "liar" is a noun performing an adjective function, meaning "dishonest person," whereas "man" functions as a noun denoting a kind of entity that combines many features. Personality-type nouns such as "liar" probably also differ from nouns denoting objects in lacking the clear hierarchical (genus–species) structure discernible among most of the latter kind of nouns.

4. One class that might prove useful for some purposes are those intransitive verbs that have clear-cut personality implications, such as *talk, fret, laugh,* and *cry*. Such verbs can be used in a sentence frame such as "Compared to others of the same sex and age, the target person *verbs* (1) far less, (2) somewhat less, (3) about the same, (4) somewhat more, or (5) far more than do others." However, such verbs share with their adjectival equivalents the problem of delimiting "personality-relevant" terms from the larger set that includes other person-related variables such as physical and medical descriptors (e.g., *sneeze, cough, drool*) and other types of tangential descriptors (e.g., *kiss, exercise, wash*).

5. The emphasis on factor analysis over cluster-analytic procedures is natural, given a documented linguistic principle (Deese, 1965): Nouns are primarily associated with one another by a grouping scheme (e.g., *crow, raven, blackbird*) that suggests clusters without bipolar relations. However, adjectives are more often associated with one another by a contrast scheme that includes antonyms and bipolarity (e.g., *kind* and *cruel, smart* and *stupid*).

The only adjectives that do not follow this principle seem to be those for color. Because factor analysis can organize variables with bipolar dimensionality, factoring procedures are generally better suited than clustering techniques to analyses of personality-related adjectives.

6. In our view, the cross-language replications of the Big Five model constitute more powerful evidence in its support than do the classic analyses of Tupes and Christal (1961) and others using Cattell's variable selections. Although initially influenced by the lexical hypothesis, Cattell's procedures deviated significantly from the lexical approach; for a review, see John (1990).

7. Most of these terms are used to describe individual differences in political (e.g., *democratic, patriotic, progressive, ultraconservative*) and religious (e.g., *atheistic, irreligious, pious, puritanical*) attitudes.

References

Allport, G. W. (1937). *Personality: A psychological interpretation.* New York: Holt.

Allport, G. W. (1946). Personalistic psychology as science: A reply. *Psychological Review, 53,* 132–135.

Allport, G. W. (1961). *Pattern and growth in personality.* New York: Holt, Rinehart & Winston.

Allport, G. W., & Odbert, H. S. (1936). Trait-names: A psycho-lexical study. *Psychological Monographs, 47*(1, Whole No. 211).

Angleitner, A., Ostendorf, F., & John, O. P. (1990). Towards a taxonomy of personality descriptors in German: A psycho-lexical study. *European Journal of Personality, 4,* 89–118.

Austin, J. L. (1957). A plea for excuses. *Proceedings of the Aristotelian Society, 57,* 1–30.

Bakan, D. (1966). *The duality of human existence.* Boston: Beacon.

Barnhart, R. K. (Ed.). (1988). *The Barnhart dictionary of etymology.* New York: Wilson.

Block, J. (1995). A contrarian view of the five-factor approach to personality description. *Psychological Bulletin, 117,* 187–215.

Block, J. H., & Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.), *Minnesota symposia on child psychology* (Vol. 13, pp. 39–101). Hillsdale, NJ: Erlbaum.

Brokken, F. B. (1978). *The language of personality.* Meppel, Netherlands: Krips.

Cattell, R. B. (1943). The description of personality: Basic traits resolved into clusters. *Journal of Abnormal and Social Psychology, 38,* 476–506.

Cattell, R. B. (1957). *Personality and motivation: Structure and measurement.* Yonkers, NY: World Book.

Chaplin, W. F., John, O. P., & Goldberg, L. R. (1988). Conceptions of states

and traits: Dimensional attributes with ideals as prototypes. *Journal of Personality and Social Psychology, 54,* 541–557.

Chomsky, N. (1957). *Syntactic structures.* The Hague: Mouton.

Costa, P. T., Jr., & McCrae, R. R. (1976). Age differences in personality structure: A cluster-analytic approach. *Journal of Gerontology, 31,* 564–570.

Costa, P. T., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual.* Odessa, FL: Psychological Assessment Resources.

Croft, W. (1991). *Syntactic categories and grammatical relations: The cognitive organization of information.* Chicago: University of Chicago Press.

De Raad, B., & Hofstee, W. K. B. (1993). A circumplex approach to the Five Factor model: A facet structure of trait adjectives supplemented by trait verbs. *Personality and Individual Differences, 15,* 493–505.

De Raad, B., & Hoskens, M. (1990). Personality-descriptive nouns. *European Journal of Personality, 4,* 131–146.

De Raad, B., Mulder, E., Kloosterman, K., & Hofstee, W. K. B. (1988). Personality-descriptive verbs. *European Journal of Personality, 2,* 81–96.

De Raad, B., & Szirmak, Z. (1994). The search for the "Big Five" in a non-Indo-European language: The Hungarian trait structure and its relationship to the EPQ and the PTS. *European Review of Applied Psychology, 44,* 17–26.

Deese, J. (1965). *The structure of associations in language and thought.* Baltimore, MD: Johns Hopkins Press.

Dixon, R. M. W. (1977). Where have all the adjectives gone? *Studies in Language, 1,* 19–80.

Einhorn, H. J., & Hogarth, R. M. (1978). Confidence in judgment: Persistence of the illusion of validity. *Psychological Review, 85,* 395–416.

Eysenck, H. J. (1991). Dimensions of personality: 16, 5, or 3?—Criteria for a taxonomic paradigm. *Personality and Individual Differences, 12,* 773–790.

Goldberg, L. R. (1981). Language and individual differences: The search for universals in personality lexicons. In L. Wheeler (Ed.), *Review of personality and social psychology* (Vol. 2, pp. 141–165). Beverly Hills, CA: Sage.

Goldberg, L. R. (1982). From Ace to Zombie: Some explorations in the language of personality. In C. D. Spielberger & J. N. Butcher (Eds.), *Advances in personality assessment* (Vol. 1, pp. 203–234). Hillsdale, NJ: Erlbaum.

Goldberg, L. R. (1990). An alternative "Description of personality": The Big-Five factor structure. *Journal of Personality and Social Psychology, 59,* 1216–1229.

Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment, 4,* 26–42.

Goldberg, L. R. (1993a). Author's reactions to the six comments. *American Psychologist, 48,* 1303–1304

Goldberg, L. R. (1993b). The structure of personality traits: Vertical and horizontal aspects. In D. C. Funder, R. D. Parke, C. Tomlinson-Keasey, &

K. Widaman (Eds.), *Studying lives through time: Personality and development* (pp. 169–188). Washington, DC: American Psychological Association.

Goldberg, L. R. (1993c). The structure of phenotypic personality traits. *American Psychologist, 48,* 26–34.

Goldberg, L. R. (1994). How not to whip a straw dog: A critique of Pervin's "Critical analysis of current trait theory." *Psychological Inquiry, 5,* 128–130.

Goldberg, L. R., & Digman, J. M. (1994). Revealing structure in the data: Principles of exploratory factor analysis. In S. Strack & M. Lorr (Eds.), *Differentiating normal and abnormal personality* (pp. 216–242). New York: Springer.

Goldberg, L. R., & Kilkowski, J. M. (1985). The prediction of semantic consistency in self-descriptions: Characteristics of persons and of terms that affect the consistency of responses to synonym and antonym pairs. *Journal of Personality and Social Psychology, 48,* 82–98.

Goldberg, L. R., & Rosolack, T. K. (1994). The Big-Five factor structure as an integrative framework: An empirical comparison with Eysenck's P-E-N model. In C. F. Halverson, G. A. Kohnstamm, & R. P. Martin (Eds.), *The developing structure of temperament and personality from infancy to adulthood* (pp. 7–35). Hillsdale, NJ: Erlbaum.

Goldberg, L. R., & Saucier, G. (1994). So what do you propose we use instead? A reply to Block. *Psychological Bulletin, 117,* 221–225.

Greenwood, J. D. (1991). *Relations and representations.* London: Routledge.

Hampson, S. E. (1994). The construction of personality. In A. M. Colman (Ed.), *Companion encyclopedia of psychology* (pp. 602–621). London: Routledge.

Hampson, S. E., John, O. P., & Goldberg, L. R. (1986). Category breadth and hierarchical structure in personality: Studies of asymmetries in judgments of trait implications. *Journal of Personality and Social Psychology, 51,* 37–54.

Hofstee, W. K. B., & De Raad, B. (1991). Persoonlijkheidsstructuur: de AB5C taxonomie van Nederlandse eigenschapstermen [Personality structure: The AB5C taxonomy of Dutch trait terms]. *Nederlands Tijdschrift voor de Psychologie, 46,* 262–274.

Hofstee, W. K. B., De Raad, B., & Goldberg, L. R. (1992). Integration of the Big Five and circumplex approaches to trait structure. *Journal of Personality and Social Psychology, 63,* 146–163.

John, O. P. (1990). The "Big Five" factor taxonomy: Dimensions of personality in the natural language and in questionnaires. In L. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 66–100). New York: Guilford Press.

John, O. P., Hampson, S. E., & Goldberg, L. R. (1991). The basic level in personality-trait hierarchies: Studies of trait use and accessibility in different contexts. *Journal of Personality and Social Psychology, 60,* 348–361.

John, O. P., & Robins, R. W. (1993). Gordon Allport: Father and critic of the

five-factor model. In K. H. Craik, R. Hogan, & R. N. Wolfe (Eds.), *Fifty years of personality psychology* (pp. 215–236). New York: Plenum Press.

John, O. P., & Robins, R. W. (1994). Traits and types, dynamics and development: No doors should be closed in the study of personality. *Psychological Inquiry, 5,* 137–142.

Kelley, H. H. (1992). Common-sense psychology and scientific psychology. In M. R. Rosenzweig & L. W. Porter (Eds.), *Annual review of psychology* (Vol. 43, pp. 1–23). Palo Alto, CA: Annual Reviews.

Kiss, G. R. (1973). Grammatical word classes: A learning process and its simulation. In G. H. Bower (Ed.), *The psychology of learning and motivation: Advances in research and theory* (Vol. 7, pp. 1–41). New York: Academic Press.

Klages, L. (1926). *Die Grundlagen der Charakterkunde* [*The science of character*]. Leipzig: Barth.

Macnamara, J. (1972). Cognitive basis of language learning in infants. *Psychological Review, 79,* 1–13.

McCrae, R. R. (1990). Traits and trait names: How well is Openness represented in natural languages? *European Journal of Personality, 4,* 119–129.

McCrae, R. R., & Costa, P. T. (in press). Conceptions and correlates of openness to experience. In R. Hogan, J. A. Johnson, & S. R. Briggs (Eds.), *Handbook of personality psychology.* Orlando, FL: Academic Press.

McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality, 60,* 175–215.

Miller, G. A., & Johnson-Laird, P. N. (1976). *Language and perception.* Cambridge, MA: Harvard University Press.

Norman, W. T. (1963). Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. *Journal of Abnormal and Social Psychology, 66,* 574–583.

Norman, W. T. (1967). *2800 personality trait descriptors: Normative operative characteristics for a university population.* Unpublished manuscript, Department of Psychology, University of Michigan.

Ostendorf, F. (1990). *Sprache und Persoenlichkeitsstruktur: zur Validitaet des Funf-Faktoren-Modells der Persoenlichkeit* [*Language and personality structure: On the validity of the five-factor model of personality*]. Regensburg, Germany: S. Roderer Verlag.

Ozer, D. J., & Reise, S. P. (1994). Personality assessment. In L. W. Porter & M. R. Rosenzweig (Eds.), *Annual review of psychology* (Vol. 45, pp. 357–388). Palo Alto, CA: Annual Reviews.

Paivio, A., & Begg, I. (1981). *Psychology of language.* Englewood Cliffs, NJ: Prentice-Hall.

Paunonen, S. (1993, August). *Sense, nonsense, and the Big Five factors of personality.* Paper presented at the 101st annual meeting of the American Psychological Association, Toronto, Canada.

Peabody, D. (1987). Selecting representative trait adjectives. *Journal of Personality and Social Psychology, 52,* 59–71.

Peabody, D., & Goldberg, L. R. (1989). Some determinants of factor structures from personality-trait descriptors. *Journal of Personality and Social Psychology, 57,* 552–567.

Pervin, L. A. (1994). A critical analysis of current trait theory. *Psychological Inquiry, 5,* 103–113.

Rosch, E. H., & Mervis, C. B. (1975). Family resemblances: Studies in the internal structure of categories. *Cognitive Psychology, 7,* 573–605.

Ross, L. (1977). The intuitive psychologist and his shortcomings. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10, pp. 174–220). New York: Academic Press.

Saucier, G. (1992a). Benchmarks: Integrating affective and interpersonal circles with the Big-Five personality factors. *Journal of Personality and Social Psychology, 62,* 1025–1035.

Saucier, G. (1992b). Openness versus Intellect: Much ado about nothing? *European Journal of Personality, 6,* 381–386.

Saucier, G. (1994a). Mini-markers: A brief version of Goldberg's unipolar Big-Five markers. *Journal of Personality Assessment, 63,* 506–516.

Saucier, G. (1994b, August). *Positive and negative valence: Beyond the Big Five?* Paper presented at the 102nd annual meeting of the American Psychological Association, Los Angeles, CA.

Saucier, G. (1994c). Separating description and evaluation in the structure of personality attributes. *Journal of Personality and Social Psychology, 66,* 141–154.

Saucier, G. (1995, August). *Sampling the latent structure of person descriptors.* Paper presented at the 103rd annual meeting of the American Psychological Association, New York, NY.

Saussure, F. de (1983). *Cours de linguistique générale* [*Course in general linguistics*]. Paris: Payot.

Shadel, W. G., & Cervone, D. (1993). The Big Five versus nobody? *American Psychologist, 48,* 1300–1302.

Shweder, R. A. (1989). Post-Nietzschean anthropology: The idea of multiple objective worlds. In M. Krausz (Ed.), *Relativism: Interpretation and confrontation* (pp. 99–139). Notre Dame, IN: Notre Dame University Press.

Simpson, G. (1961). *Principles of animal taxonomy.* New York: Columbia University Press.

Stagner, R. (1994). Traits and theoreticians. *Psychological Inquiry, 5,* 166–168.

Sternberg, R. J., Conway, B. E., Ketron, J. L., & Bernstein, M. (1981). People's conceptions of intelligence. *Journal of Personality and Social Psychology, 41,* 37–55.

Szirmak, S., & De Raad, B. (1994). Taxonomy and structure of Hungarian personality traits. *European Journal of Personality, 8,* 95–117.

Tellegen, A. (1993). Folk-concepts and psychological concepts of personality and personality disorder. *Psychological Inquiry, 4,* 122–130.

Tellegen, A., & Waller, N. G. (1987, August). *Re-examining basic dimensions of natural language trait descriptors.* Paper presented at the 95th annual meeting of the American Psychological Association, New York, NY.

Tupes, E. C., & Christal, R. E. (1961). *Recurrent personality factors based on trait*

ratings (USAF ASD Tech. Rep. No. 61-97). Lackland Air Force Base, TX: U.S. Air Force. (Republished in *Journal of Personality,* 1992, *60,* 225-251)

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185,* 1124-1131.

Waller, N. G. (in press). Evaluating the structure of personality. In C. R. Cloninger (Ed.), *Personality and psychopathology.* Washington, DC: American Psychiatric Press.

Whorf, B. L. (1956). *Language, thought, and reality.* New York: Wiley.

Wierzbicka, A. (1986). What's in a noun? (Or: How do nouns differ in meaning from adjectives?) *Studies in Language, 10,* 353-389.

Wiggins, J. S. (1991). Agency and communion as conceptual coordinates for the understanding and measurement of interpersonal behavior. In W. M. Grove & D. Cicchetti (Eds), *Thinking clearly about psychology: Essays in honor of Paul E. Meehl: Vol. 2. Personality and psychopathology* (pp. 89-113). Minneapolis: University of Minnesota Press.

Wiggins, J. S., & Trapnell, P. D. (in press). Personality structure: The return of the Big Five. In R. Hogan, J. A. Johnson, & S. R. Briggs (Eds.), *Handbook of personality psychology.* Orlando, FL: Academic Press.

Wittgenstein, L. (1953). *Philosophical investigations* (G. E. M. Anscombe, Trans.). New York: Macmillan.

Zipf, G. K. (1949). *Human behavior and the principle of least effort.* Cambridge, MA: Addison-Wesley.