A Theoretical Basis for the Major Dimensions of Personality

MICHAEL C. ASHTON*[1] and KIBEOM LEE[2]

[1]*Brock University, St. Catharines, ON, Canada*
[2]*The University of Western Australia, Nedlands, WA, Australia*

Abstract

We argue that lexical studies of personality structure suggest the existence of six major dimensions of personality: (I) Surgency, (II) Agreeableness, (III) Conscientiousness, (IV) Emotional Stability, (V) Intellect/Imagination, and (VI) Honesty. We then propose a two-part theoretical basis for these dimensions. First, Honesty and rotated variants of Agreeableness and Emotional Stability are interpreted in terms of three traits—fairness/non-exploitation, forgiveness/non-retaliation, and empathy/attachment—that underlie prosocial versus antisocial tendencies. Second, the Surgency, Conscientiousness, and Intellect/Imagination factors are interpreted as traits that involve active engagement within three domains of endeavour—social, task-related, and idea-related endeavour. Predictions that follow from these interpretations are tested and found to be supported. Copyright © 2001 John Wiley & Sons, Ltd.

INTRODUCTION

In this paper, we review lexical studies of personality structure and conclude that these studies suggest the existence of six major dimensions of personality variation. We then provide a two-part theoretical framework for understanding these dimensions. First, we propose that three of the major personality dimensions can be interpreted in terms of three traits—fairness (versus exploitation), forgiveness (versus retaliation), and empathy/attachment—that underlie prosocial versus antisocial behaviour. Second, we propose that the other three dimensions can be interpreted as traits that involve active engagement within three domains of endeavour—social, task-related, and idea-related endeavour. After describing each of the proposed interpretations, we report the results of empirical tests of those interpretations.

*Correspondence to: Michael C. Ashton, Department of Psychology, Brock University, St. Catharines, ON L2S 3A1, Canada. E-mail: mashton@spartan.ac.brocku.ca

THE STRUCTURE OF PERSONALITY CHARACTERISTICS

Standard lexical studies of personality structure

An important goal of personality psychology is to discover the factor structure of personality characteristics, but attempts to find that structure must be based on representative samples of the universe of those characteristics. The only recognized basis for obtaining such samples is derived from the Lexical Hypothesis, which states that the most important personality traits are encoded as single terms in natural languages (see e.g. Goldberg, 1990, 1993). Based on this assumption, the lexical approach to personality structure attempts to identify the major dimensions of personality by factor analysing ratings (usually self- or peer ratings) on comprehensive sets of personality trait adjectives.[1]

Lexical studies of personality structure have been conducted in many different languages, and have found several major dimensions that have replicated quite widely. Table 1 lists several lexical studies that have been conducted according to what we call 'standard' procedures. These standard lexical studies are characterized by the analysis of single personality-descriptive terms that have been selected according to objective criteria, such as rated familiarity, frequency of use, or utility for describing personality, rather than having been selected from subjectively derived synonym clusters.[2] We will later address the results of studies that have adopted broader variable selections, or that have analysed variables derived from synonym clusters.

The ten independent studies presented in Table 1 have repeatedly produced variants of Surgency (I), Agreeableness (II), Conscientiousness (III), and Emotional Stability (IV), the first four factors of the well-known Big Five (see comparisons by De Raad, Perugini, Hrebickova and Szarota, 1998).[3] The other Big Five factor, Intellect/Imagination (V), and a newly suggested major dimension of personality, Honesty (VI) (Ashton, Lee and Son, 2000), have also repeatedly emerged, but less robustly in terms of their fidelity and/or frequency.

Before discussing the status of the two least replicable factors—Intellect/Imagination and Honesty—we first note that some factors obtained in lexical studies have been identified as rotational variants of the major dimensions (see the last column in Table 1). For example, in the two Italian studies (Caprara and Perugini, 1994; Di Blas and Forzi, 1998, 1999), there emerged two factors that corresponded to the bisectors of the

---

[1]Although lexical studies of personality structure have occasionally been undertaken with the use of verbs or nouns as personality-descriptive variables (see e.g. De Raad, 1992), the use of adjectives has been vastly more common. The reason for the preferred status of adjectives is that they represent '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, [even though] it can be carried out by other word classes' (Saucier and Goldberg, 1996a, pp. 30–31).

[2]In our summary, we consider studies representing the same language as a single unit, unless they used substantially different adjective sets. For example, the German studies by Angleitner and Ostendorf (1989) and Ostendorf and Angleitner (1993) are considered as a single unit, and so are the two Italian studies reported by Di Blas and Forzi (1998, 1999). (In both of those cases, the sets of adjectives used in the two studies were identical or almost identical, and the results were extremely similar.) In contrast, the Italian study reported by Caprara and Perugini (1994) used a different adjective set from that used by Di Blas and Forzi, and obtained different results; it is considered as a separate standard lexical study.

[3]Factors I and IV are also known as Extraversion and (low) Neuroticism. In this paper we will use the names Surgency and Emotional Stability in order to prevent confusion with the similar, but not necessarily identical, constructs proposed by Eysenck (1947) and by Costa and McCrae (e.g. 1992).

Agreeableness and Emotional Stability axes. In the Korean lexical study (Hahn *et al.*, 1999), a different rotation was observed in the plane involving Conscientiousness and Imagination/Intellect. In a recent French lexical study (Boies, Lee, Ashton, Pascal and Nicol, in press), two of the French dimensions were rotated variants of the Surgency and Emotional Stability factors. Although such rotational variations are interesting, they should not be seen as evidence indicating a lack of cross-language consistency to the structure of personality characteristics. Regardless of the exact location of factor axes, rotational variations do not reduce the fidelity with which the personality space is replicated. It is the *space* formed by personality dimensions, not the location of the factor axes *per se*, that determines the ability of a taxonomic model to describe personality traits.

For a better understanding of the content of the less replicable dimensions—Intellect/ Imagination and Honesty—we have listed adjectives that loaded most strongly on these two factors in each study (see Table 1). With respect to Intellect/Imagination, some studies have failed to find this dimension within five-factor solutions (in the Hungarian study by Szirmak and De Raad, 1994) or even six-factor solutions (in the Italian study by Di Blas and Forzi, 1998). In both studies, Intellect/Imagination was preceded by Honesty. Furthermore, the 'fifth' factors observed in the (Roman) Italian (Caprara and Perugini, 1994), Dutch (De Raad *et al.*, 1992), and French studies (Boies *et al.*, in press), which were interpreted as variants of the Big Five Intellect/Imagination factor by the authors, were somewhat different from other languages' variants of Intellect/Imagination (see the defining terms in Table 1). Specifically, those factors were defined mainly by terms related to Unconventionality (and, in the French case, Imagination), but were not strongly defined by terms related to Intellect, which has been the central component of the fifth factor in other lexical studies.

Table 1 also shows the quite impressive recurrence of the Honesty factor in previous lexical studies (see Ashton *et al.*, 2000). Specifically, seven independent studies representing six languages have observed this factor in very similar form (Angleitner and Ostendorf, 1989; Boies *et al.*, in press; Di Blas and Forzi, 1998, 1999; Hahn *et al.*, 1999; Perugini M, personal communication, 2000, based on study 1 in Caprara and Perugini, 1994; Szarota P, personal communication, 1999, based on Szarota, 1996; Szirmak and De Raad, 1994). In contrast, the Honesty factor has failed to emerge in the standard lexical studies of at least two languages: English (Saucier and Goldberg, 1996b) and Czech (Hrebickova, 1995). In addition, the six-factor solution of the Dutch lexical study conducted by De Raad *et al.* (1992) is unavailable.

Given the less-than-perfect replicability of the Intellect/Imagination and Honesty factors, one might suggest that we should accept the only first four factors as the major dimensions of personality. However, we believe that the six-dimensional structure is more likely to provide an adequate descriptive taxonomy of personality traits, for three simple reasons. First, the replicability of Intellect/Imagination and Honesty is still remarkable across different languages: as Table 1 shows, at least 70% of these studies have observed these two factors. This level of replicability should be considered impressive, given that small variations in the different studies' selection procedures or in the different languages' personality lexicons might be expected sometimes to obscure the emergence of factors, such as Intellect/Imagination and Honesty, that are usually represented by a smaller number of terms than is the case for the first four factors. In any case, *six languages—French, German, Hungarian, (Roman) Italian, Korean, and Polish—have produced a six-factor solution in which the obtained factors correspond to the six factors*

Table 1. Standard lexical studies of personality structure, with terms that defined the Intellect/Imagination and Honesty factors

Study	Language	Defining terms of V	Defining terms of VI	Notes
Angleitner and Ostendorf (1989); Ostendorf and Angleitner (1993)	German	Very intelligent, very learned, very talented, intelligent, bright, endowed with, knowledgeable, very erudite *versus* weak in thinking, unintelligent	Honest, sincere, humane, truth-loving, truthful, modest, just/fair *versus* dishonest, corrupt, boastful, grasping, arrogant	● All six factors replicated in peer ratings (1993)
De Raad, Hendriks and Hofstee (1992)	Dutch	Critical, mutinous, fierce, rebellious dynamic *versus* slavish, shallow, virtuous, meek, docile	Unknown	● V lacked the Intellect component
Szirmak and DeRaad (1994); DeRaad and Szirmak (1996)	Hungarian	Bright, clever, intelligent, teachable, smart *versus* malicious, unpolished, bashful, shifty, peaching (sic)	Veracious, just, trustworthy, secret-keeping, humane *versus* hypocritical, swell-headed, greedy, overbearing, show-off	● VI preceded V ● Terms defining negative pole of V not related to Intellect/Imagination, but these terms had lower loadings
Caprara and Perugini (1994)	Italian (Rome)	Unconventional, transgressor, eclectic, polyhedric, ironical *versus* traditional, servile, obsequious, conservative, puritan	Sincere, modest, unpretentious, loyal honest *versus* egocentric, narcissistic, arrogant, megalomaniac, presumptuous	● VI terms are based on six-factor solution not reported in the published article (Perugini, personal commun., 2000) ● V lacked the Intellect component ● Rotational variants of II and IV
Hrebickova (1995)	Czech	Clever, intelligent, perceptive, well educated, intellectual *versus* fatuous, silly, half-witted, unintelligent, idiotic	Not found	
Saucier and Goldberg (1996b)	English	Intelligent, intellectual, smart, complex, philosophical *versus* simple, conventional, traditional, uninquisitive, unintellectual	Not found	

Study	Language	V (Intellect/Imagination)	VI (Honesty)	Notes
Di Blas and Forzi (1998, 1999)	Italian (Trieste)	Cultured, educated, ironical, critical, intelligent *versus* stupid, insensitive, unable, uncultured, rude	Sincere, loyal, trustworthy, altruistic, natural *versus* liar, untruthful, hypocrite, greedy, stingy	• VI preceded V • Rotational variants of II and IV • I split into Sociability, Assertiveness • Terms here are those with highest loadings in either 1998 or 1999 self-rating studies • All seven factors replicated in peer ratings in 1998 study
Szarota (1996)	Polish	Intelligent, creative, talented, clever, thinking, wise, versatile, sensible, sagacious, ambitious	Sincere, honest, noble-minded, disinterested, faithful, gentlemanly *versus* crafty, dishonest, sly	• Only 93 adjectives • VI not replicated in peer ratings • VI terms are based on six-factor solution not reported in the published article (Szarota, personal commun., 1999)
Hahn, Lee and Ashton (1999)	Korean	Bright, wise, intellectual, logical, smart, clever, intelligent, competent, creative *versus* simple	Truthful, frank, conscientious, honest, unassuming *versus* cunning, sly, calculating, hypocritical, pompous	• V terms listed here are based on 30° rotation of rotational variants of III and V from the six-factor solution
Boies *et al.* (in press)	French	Artistic, creative, imaginative, inventive, original, eccentric, witty, unconventional *versus* conventional, obedient	True/genuine, sincere, honest, just/fair, loyal/faithful *versus* dishonest, false/not genuine, lying, unjust/unfair, hypocritical	• V lacked Intellect component • Rotational variants of I and IV

I = Surgency; II = Agreeableness; III = Conscientiousness; IV = Emotional Stability; V = Intellect/Imagination; VI = Honesty. Factors in some of the original studies were given different names. Terms listed are the five highest-loading terms on each pole of self-rating factors (where the loadings are available), except for cases in which one pole of the factor was not well defined.

observed here (or their rotational variants),[4] albeit with some variation in the core content of the Intellect/Imagination factor.

Second, it is important to note that factors additional to these six (as opposed to the rotational variants described above) have not been regularly observed in standard lexical studies, and hence seem likely to be the result of idiosyncrasies in the studies' variable selections or in the languages' personality lexicons. Third, some important aspects of personality variation will be largely omitted if we adopt only the four-dimensional solution; a variety of traits that correlate substantially with Intellect/Imagination or with Honesty (see Ashton, Jackson, Helmes and Paunonen, 1998; Ashton *et al.*, 2000) are only very modestly correlated with the other four lexical factors. Thus, on the basis of these considerations, we suggest that the above six factors provide the most parsimonious *and* comprehensive descriptive taxonomy of human personality at the superordinate level.

About the Honesty factor

Because many readers might not yet be familiar with the sixth factor, we now address some questions that might be raised regarding the nature of this new dimension. Some of these questions involve the relation to the Big Five space of the terms that define Honesty, and the nature of the Big Five factors within the six-factor solution. First, within the space of the Big Five (as obtained in five-factor solutions), the terms defining lexical Honesty are usually located in the planes involving Agreeableness and either Conscientiousness or Emotional Stability; however, most of these terms show quite modest loadings on these factors (see e.g. Hofstee, De Raad and Goldberg, 1992; Saucier and Goldberg, 1996b).

It might seem surprising that Honesty-related terms are not highly loaded on Conscientiousness, given that the name 'Conscientiousness' suggests moral conscience, and therefore Honesty. However, within most languages, the terms that define lexical Conscientiousness most strongly are those that involve task-related conscience, as manifested in traits such as organization, efficiency, precision, and self-discipline (see e.g. Hofstee *et al.*, 1992; see also the cross-language review by De Raad *et al.*, 1998). In contrast, Honesty-related terms show only moderate loadings on Conscientiousness within five-factor solutions (see e.g. Hofstee *et al.*, 1992; Saucier and Goldberg, 1996b), and very small secondary loadings on Conscientiousness within six-factor solutions (see e.g. Boies *et al.*, in press).

Within six-factor solutions, the Big Five factors usually remain much as they appeared within five-factor solutions. For example, in both the French (Boies *et al.*, in press) and Korean (Hahn *et al.*, 1999) lexical studies, the factors obtained in the six-factor solution showed correlations with markers of the Big Five that were equally high as those that were found in five-factor solutions. The addition of the Honesty factor does not have profound impacts on the core content of the Big Five factors; the only change is that small amounts of Honesty-relevant variance that had previously been attached to these dimensions are now assimilated within Honesty, along with much new variance added by the extraction of a sixth factor.

With regard to the relations between Honesty and the Big Five factors, there is evidence to suggest that Honesty is somewhat correlated with Agreeableness. For example, the

[4]The English language might be added as a seventh case, given that an Honesty (i.e., Values) dimension—defined by the terms *honest, fair,* and *moral* versus their antonyms—has been observed as one of six dimensions in factor analyses of internal ratings of English personality-descriptive adjectives (Peabody, 1987; Peabody and Goldberg, 1989). However, these terms were selected from synonym clusters rather than on the basis of more objective criteria.

Honesty factor seems to have divided from the Agreeableness dimension of the five-factor solutions in German (Angleitner and Ostendorf, 1989; Ostendorf and Angleitner, 1993) and in Hungarian (Szirmak and De Raad, 1994; De Raad and Szirmak, 1996). Also, within the French (Boies *et al.*, in press) and Korean (Hahn *et al.*, 1999) data sets, many of the terms that defined Honesty also showed appreciable secondary loadings on Agreeableness. In light of these facts, researchers who favour perfectly orthogonal factors may prefer to view Honesty as a large and peripheral element of a very broad Agreeableness factor. Nevertheless, the two constructs are apparently sufficiently broad and sufficiently independent that they usually form separate factors in six-factor solutions (and occasionally even in five-factor solutions, prior to the emergence of an Intellect/Imagination factor). Therefore, any attempt to provide a theoretical basis for the Big Five factors is incomplete unless it also explains the Honesty factor.

Finally, it may also be useful to discuss the relation of lexical Honesty with the construct measured by the 'integrity' tests that are widely used in industrial/organizational psychology. Although the constructs measured by integrity tests have previously been found to correlate with Agreeableness, Conscientiousness, and Emotional Stability, the unique variance of these constructs (i.e. that variance not explained by the Big Five) has been found to be responsible for much of the observed criterion validity of these tests (Ashton, 1998). We suggest that much of this unique variance of integrity tests may well be accommodated within the Honesty factor. Furthermore, much of the previously observed covariance of integrity tests with the three Big Five factors listed above may be absorbed by the Honesty factor, and hence the relation of integrity test variance to the major personality dimensions might be largely due to Honesty.

Other lexical studies of personality structure

As noted earlier, we did not include in our review other lexical studies that adopted more inclusive selections of variables (e.g. Almagor, Tellegen and Waller, 1995; Benet and Waller, 1995; Tellegen, 1993). These studies included within their variable sets a variety of primarily evaluative terms (e.g. *excellent, special, remarkable, awful, disgusting, terrible*) that are typically excluded from the 'standard' lexical studies that we have discussed.[5] As a result of these broader adjective selections, some studies have found, in addition to variants of the Big Five, two additional factors that are known as Positive and Negative Valence. These two additional factors have been defined by newly included terms that are primarily evaluative.[6]

Tellegen and colleagues have interpreted these factors as the tendency to view oneself positively (Positive Valence) and negatively (Negative Valence). Put another way, the

---

[5]Of course, most adjectives are not evaluatively neutral, and indeed the first unrotated factor typically obtained in lexical studies seems to represent a contrast between evaluatively positive and evaluatively negative terms (see e.g. Di Blas, Forzi and Peabody, 2000). This dimension may represent, in part, individual differences in socially desirable responding of the kind discussed by Jackson and Messick (1958) in the context of personality questionnaire scales. However, the terms that define this first unrotated factor (e.g. *friendly/unfriendly, peaceful/irascible, consistent/inconsistent*) also have an important descriptive component. In contrast, the terms that are primarily evaluative have very little descriptive value (e.g. *outstanding, admirable, horrible, deserve-to-be-hated*).

[6]One exception is an investigation in the Hebrew language (Almagor *et al.*, 1995). Almagor *et al.* (1995) obtained factors that, although interpreted as Positive and Negative Valence, were defined by terms that are usually included in studies of personality-descriptive terms only (see Saucier, 1997, p. 1298, for a similar observation). The Positive Valence factor was defined by several terms that clearly relate to Intellect/Imagination, such as those translated as *sharp, knowledgeable,* and *original.* Also, the Negative Valence factor was bipolar, with the negative pole defined by Honesty-related terms, such as those translated as *frank, sincere,* and *honest.*

factors defined by purely evaluative terms are thought to be *signs* of important personality dimensions related to self-esteem. For example, Positive Valence may be a sign of narcissism (a view that is consistent with the findings of John and Robins, 1994), and Negative Valence may be a sign of borderline personality. Hence, unlike the Big Five dimensions, whose defining terms directly *describe* people's personality traits, the terms of these two dimensions do not directly describe people's characteristics; instead, endorsement of the defining terms is thought to indicate personality traits related to self-evaluation. However, regardless of the validity of these inferences, this strategy of including evaluative terms as potential markers of self-esteem is not consistent with the logic of the Lexical Hypothesis. The idea of lexical studies of personality structure— specifically, that we should analyse self- or peer ratings on terms taken from natural languages—is based on the fact that these terms *describe* various personality traits, and not on the fact that these terms can be used to infer other personality traits. If there did, in fact, exist major dimensions of personality that involve self-evaluation, then those dimensions would emerge in lexical studies as factors defined by terms that *describe* high or low levels of self-esteem, such as *conceited* or *self-critical*. It is therefore inappropriate to include non-descriptive terms in lexical studies of personality structure.[7]

Church, Katigbak and Reyes (1998; see also Church, Reyes, Katigbak and Grimm, 1997) included primarily evaluative terms in their lexical studies of the Tagalog (Filipino) language. But we are also aware of the results of Filipino factor analyses that included only personality-descriptive adjectives. In the Filipino five-factor solution based on the set of 405 familiar personality-descriptive adjectives (Church *et al.*, 1998, p. 258), one factor represented a mixture of Agreeableness and Conscientiousness; three others corresponded to factors roughly representing Surgency (i.e. Gregariousness/Extraversion), Emotional Stability (i.e. Self-Assurance versus Temperamentalness), and Intellect; the remaining factor, Egotism, roughly resembled the low pole of the Honesty factor, being defined by terms such as those translated as *opportunistic, manipulative, dishonest,* and *pretentious* (Church AT, personal communication, 2001). Within the six-factor solution (Church AT, personal communication, 2001), the Agreeableness and Conscientiousness factors divided, but many of the Egotism terms merged with low Agreeableness. Intellect divided into two factors, one of which absorbed many self-assurance-related terms from the Emotional Stability factor, and the other of which absorbed terms related to the pretentiousness aspects of Egotism (e.g. those translated as *show-off, boastful,* and *pretentious*).

Goldberg and Somer (2000) recently analysed a set of Turkish adjectives that included terms related to physical attractiveness, as well as infrequently endorsed terms (e.g. terms translated as *empty-headed* and *uncivilized*) that might not be considered as personality descriptors. This variable set produced seven factors that were interpreted as the Big Five dimensions, plus Negative Valence and Attractiveness. The Negative Valence factor was defined by adjectives with low endorsement means, such as those listed above, but many of these infrequently endorsed terms had some clear relation to low Honesty (e.g. terms

---

[7]Carried to its logical conclusion, the use of non-personality-descriptive terms as signs of personality constructs might lead to the discovery of many other spurious factors. For example, one could include terms such as *persecuted* and *harassed* as plausible signs of paranoia, and terms such as *sickly* or *illness-prone* as plausible signs of hypochondriasis. Following the logic of the Lexical Hypothesis, however, a hypothesized factor of paranoia would have to be defined by terms such as *paranoid, mistrustful,* and *suspicious*, and a hypothesized factor of hypochondriasis would have to be defined by terms such as *hypochondriacal, complaining,* and *whining*. If one is concerned that biases in self- or peer ratings might prevent the emergence of such factors, then other methods, such as internal ratings (see e.g. Peabody and Goldberg, 1989), could be used instead.

translated as *dishonest, swindler, giving/taking bribes*). When the Attractiveness and Negative Valence terms were removed, Goldberg and Somer (2000) recovered the Big Five factors, with the fifth factor defined primarily by terms related to Imagination and Unconventionality, rather than Intellect. A six-factor solution (provided by L. R. Goldberg, personal communication, 2000) did not produce a factor interpretable as Honesty, but most of the terms related to low Honesty were among those that had been removed on the basis of low endorsement means. An earlier Turkish investigation (Somer and Goldberg, 1999), which used self- and liked peer ratings on adjectives selected on the basis of synonym clustering, did produce a Values factor that is roughly similar to Honesty, in addition to the Big Five and an Attractiveness factor.

Thus, the results of the Filipino and Turkish studies do not provide clear support for the six-factor solution described in the previous section, but neither do these results undermine the generality of those six factors. The Filipino lexical results, when based on personality-descriptive terms, did not reproduce that six-factor structure, but did yield recognizable variants of each of the six factors, within either the five- or six-factor solutions. The Turkish lexical results provide clear evidence for the Big Five factors, including a variant of Intellect/Imagination, and are very suggestive regarding the Honesty factor, whose defining terms were infrequently endorsed by Turkish respondents.[8]

Summary

The above review of lexical studies from various languages suggests that the most parsimonious and comprehensive model of personality structure involves a six-dimensional space in which the six axes are variants of (I) Surgency, (II) Agreeableness, (III) Conscientiousness, (IV) Emotional Stability, (V) Intellect/Imagination, and (VI) Honesty. These dimensions have emerged in a majority of lexical studies of personality structure, frequently producing a similar six-factor solution, and no additional factors have emerged with comparable regularity.

Although the six-factor solution described above has been found in several languages' lexical studies of personality structure, there remains the fundamental question of *why* these are the major dimensions of personality. Rather than merely having a taxonomy that locates personality characteristics within a six-dimensional space, it would be useful to have a theory of personality structure that can explain the functions of these dimensions of individual differences. In the remainder of this paper, we try to develop a theoretical basis for the major dimensions of personality. First, we argue that the dimensions of Honesty, Agreeableness, and Emotional Stability can be understood as individual differences in the

---

[8]The findings of the Turkish studies suggest that the Turkish personality lexicon might contain a dimension of Honesty, but that its defining adjectives tend to have such extreme endorsement means that variation in responses to those terms reflects a tendency to endorse low base-rate terms regardless of meaning, more than true variation in self-perceived honesty. A study based on internal ratings (cf. Peabody and Goldberg, 1989) might resolve the question of whether or not there really exists an Honesty dimension in the Turkish personality lexicon.

We should note that, within other languages, the Honesty factor is not defined exclusively by terms that possess extreme endorsement levels and/or highly skewed distributions. For example, several of the terms that strongly defined the Honesty factor in the French-language study were not highly skewed, and several of the most skewed terms in that analysis did not load highly on the Honesty factor (Boies *et al.*, in press); this is also true of the Korean Honesty (i.e. Truthfulness) factor of Hahn *et al.* (1999). (In contrast, Saucier (1997) found that an English Negative Valence factor was defined only by highly skewed terms, *all* of which loaded on that factor.) Also, the Italian study by Di Blas and Forzi (1999) obtained an Honesty (i.e. Trustworthiness) factor even though highly skewed terms had been excluded from their analysis. In addition, the Honesty (i.e. Values) factor of Peabody and Goldberg (1989) was based on internal ratings (see Footnote 4), to which the problem of extreme endorsement levels and highly skewed distributions does not apply.

tendencies that underlie prosocial versus antisocial behaviour. Second, we argue that the dimensions of Surgency, Conscientiousness, and Intellect/Imagination can be understood as individual differences in engagement within three domains of endeavour.

THEORETICAL BASIS OF HONESTY, AGREEABLENESS, AND EMOTIONAL STABILITY

In this section, we propose that individual differences in the tendency to behave prosocially rather than antisocially can be understood in terms of the three-dimensional space spanned by the personality dimensions of Honesty, Agreeableness, and Emotional Stability. We first describe two bases for prosocial behaviour—reciprocity and empathy- or attachment-based prosociality—and their correspondence to three personality characteristics. Then, we test the relations between these characteristics and the major dimensions of personality.

Personality traits corresponding to bases of prosocial versus antisocial behaviour

Reciprocity and prosocial versus antisocial behaviour
One widely studied source of prosocial versus antisocial behaviour is reciprocity: an apparently altruistic act may in fact be in the interest of the actor, given a sufficiently high probability of reciprocation of an equivalent act by the recipient (see e.g. Trivers, 1971). The repeated-iteration Prisoner's Dilemma is often used as a model of such reciprocity, and this model can be described concisely in terms of a game: 'Two players engaged in the Prisoner's Dilemma have to choose between cooperation (C) and defection (D). In any given round, the two players receive R points if both cooperate and P points if both defect; but a defector exploiting a cooperator gets T points, while the cooperator receives S (with $T > R > P > S$ and $2R > T + S$)' (Nowak and Sigmund, 1993, p. 56). Thus, for two persons involved in real-life interactions satisfying the conditions of the Prisoner's Dilemma, a pattern of long-run cooperation is better than a pattern of long-run mutual defection.

Despite the advantage of this cooperation, however, there are two main obstacles to its establishment and maintenance. First, the fact that $T > R$ means that there is some temptation to defect if the other person seems to be a 'sucker' who is likely to cooperate despite being exploited. Second, the fact that $P > S$ means that there is some temptation to defect if the other player seems to be a 'cheat' who is likely to exploit a cooperative opponent. We suggest that individual differences in the strengths of these tendencies, within real-life situations, can be viewed as personality traits. First, the tendency to cooperate (versus defect) against an apparent sucker can be viewed as a personality characteristic that might be called fairness (versus exploitation). Similarly, the tendency to cooperate (versus defect) against an apparent cheat can be viewed as a personality characteristic that might be called forgiveness (versus retaliation). In this sense, an extremely fair person is one who behaves *as if* defection would always be reciprocated (even when this is known not to be the case), and an extremely forgiving person is one who behaves *as if* cooperation would always be reciprocated (even when this is known not to be the case).

Interestingly, the personality constructs suggested above have some counterparts in the strategies that have been successful in Prisoner's Dilemma computer simulations. For example, the notions of forgiveness and retaliation are involved in the 'tit for tat' strategy,

which recommends 'retaliation' against those who have ceased to reciprocate cooperation, but 'forgiveness' of those who have resumed cooperation (Axelrod, 1984; Rapoport and Chammah, 1965). Similarly, the notions of fairness and exploitation are reminiscent of the 'win–stay, lose–shift' or 'Pavlov' strategy, which recommends that a player should have 'no qualms in exploiting a sucker' who does not retaliate, but should not persist in trying to exploit an individual who does retaliate (Nowak and Sigmund, 1993, p. 56). Thus, this strategy represents a low level of fairness; in contrast, 'tit for tat' does not exploit an unconditional cooperator.

Empathy/attachment and prosocial versus antisocial behaviour

As noted above, an apparently altruistic act can be in the interest of the actor, if there is a sufficient likelihood of reciprocation. But there exists, in addition to the prospect of future reciprocation, another reason why an apparently altruistic act may be in the interest of the donor: the intrinsic value, to the donor of the recipient's welfare. If one person cares about another—that is, if one person values another's welfare at some appreciable fraction of the value of one's own—then the threshold for behaving prosocially (or for inhibiting antisocial behavior) is lower than would be estimated on the basis of reciprocity alone. This tendency to ascribe intrinsic value to the welfare of another is manifested in emotions such as empathic concern and emotional attachment, which have been widely studied by social psychologists in the context of prosocial behaviour. Some of this research is discussed below.

Several studies have shown that feelings of empathic concern are associated with altruistic behaviour toward the object of that concern (e.g. Batson, Duncan, Ackerman, Buckley and Birch, 1981; Krebs, 1975). Some recent research has suggested that empathic concern is related to helping behaviour primarily because empathy is an emotional signal of 'oneness'—i.e. feelings of deep emotional attachment characterized by a sense of overlap between self and other—and that such feelings of oneness may be the more fundamental cause of helping behaviour (Cialdini, Brown, Lewis, Luce and Neuberg, 1997). This claim has been disputed (Batson, Sager, Garst, Kang, Rubchinsky and Dawson, 1997), but there is agreement that feelings of empathy and of oneness (or attachment) are best elicited in the context of close relationships (Batson, Turk, Shaw, and Klein 1995; Cialdini *et al.*, 1997). Moreover, Cialdini *et al.* (1997) suggested that feelings of oneness are evoked by factors that suggest common genetic makeup, such as kinship, friendship, familiarity, and similarity. Thus, the tendency to feel emotional attachment or empathic concern seems to underlie individual differences in prosocial behaviour that is typically directed toward kin (Hamilton, 1964) or other genetically similar individuals (Rushton, Russell and Wells, 1984).

Relations of fairness/non-exploitation, forgiveness/non-retaliation, and empathy/attachment to the major dimensions of personality

Some clear predictions can be made with regard to the mapping between the three personality traits described above and the major dimensions of personality. First, we suggest that fairness versus exploitation is primarily related to the Honesty factor. This prediction seems consistent with several of the adjectives that have defined the positive pole of the Honesty factor—such as *fair, honest, moral,* and *trustworthy*—and also suggest a reluctance to exploit others. Other terms that have defined the negative pole of this factor, such as *greedy*, also seem highly relevant to exploitation; in fact, some researchers have explicitly defined greed as 'the temptation to gain the extra benefit of unilateral noncooperation over mutual cooperation' (Hwang and Burgers, 1997, p. 70)!

Other terms suggesting egotism, pretentiousness, or narcissism have sometimes defined the negative pole of Honesty, and these constructs also have some theoretical links to exploitation. For example, part of the construct of psychopathy is a 'grandiose sense of self-worth' (Harpur, Hare and Hakstian, 1989).

Second, we have previously suggested that forgiveness versus retaliation is related positively to both Agreeableness and Emotional Stability (Ashton *et al.*, 1998a). This prediction seems consistent with the content of the adjectives that define the high Emotional Stability/high Agreeableness quadrant—terms such as *patient, peaceful*, and *tolerant* versus *quarrelsome* and *temperamental*—which suggest a willingness to forgive and a reluctance to retaliate.

Third, we have also previously suggested that individual differences in the tendency to feel empathic concern and emotional attachment are related positively to Agreeableness and negatively to Emotional Stability (Ashton *et al.*, 1998a). This prediction seems consistent with the adjectives that define the high Agreeableness/low Emotional Stability quadrant—terms such as *affectionate, emotional, romantic, sensitive,* and *sentimental*—which suggest feelings both of empathic concern and of emotional attachment.

Evidence for the proposed interpretations

Semantic evidence

One very straightforward method of testing the proposed interpretations of the Honesty, Agreeableness, and Emotional Stability factors is to find out what kind of target person tends to be described by the adjectives that define these factors. That is, do people use Honesty adjectives to describe persons who decline to exploit others? Do people use Agreeableness-plus-Emotional Stability adjectives to describe persons who decline to retaliate against others? Do people use Agreeableness-minus-Emotional Stability adjectives to describe persons who feel empathic concern and emotional attachment for others?

One way to address these questions would be to ask respondents to make ratings of the personality characteristics of real persons who are observed to behave in ways that correspond to the proposed interpretations. For example, individuals' choices in a Prisoner's Dilemma-style game might be used to depict varying levels of fairness (versus exploitation) and forgiveness (versus retaliation), respectively, and respondents could be asked to rate the personalities of these individuals, using terms that define the various personality factors. However, we addressed these questions using an even simpler approach, which used descriptions of hypothetical persons.

Specifically, we first constructed brief descriptions of three hypothetical persons whose behaviours are consistent with the proposed interpretations. Then we asked respondents to indicate how accurately various personality-relevant adjectives match those descriptions. For each of 24 adjectives, 12 graduate and senior undergraduate students were asked to indicate, using a nine-point scale (-4 to $+4$), 'How well does the adjective _____ match the description of someone who . . .'. This sentence was completed by three different descriptions. One description indicated a high level of fairness (versus exploitation): '. . . feels inclined *not* to exploit, cheat, or take advantage of others, even when he/she could get away with it'. Another indicated a high level of forgiveness (versus retaliation): '. . . feels inclined to forgive (does *not* feel an urge to retaliate) when exploited or treated unjustly by others'. Another indicated a high level of empathy/attachment: '. . . feels intense attachment and empathy toward his/her spouse, children, parents, siblings, and best friends'. For each of the 24 adjectives, the three descriptions were presented

consecutively; the adjectives were presented in one of two different orders (alphabetical A–Z, or alphabetical P–Z, A–O). On the nine-point response scale, anchors were provided for the -4 (exactly opposite), 0 (irrelevant), and $+4$ (exactly the same) points.

The 24 adjectives used in this task included eight markers of the Honesty factor—*fair, honest, moral,* and *trustworthy* versus *dishonest, egotistical, greedy,* and *unfair*—that were selected from the English 'Values' factor obtained by Peabody and Goldberg (1989) and from English translations of terms defining other languages' variants of the Honesty factor (see Table 1 of this article and Table 1 of Ashton *et al.*, 2000). Eight other adjectives, selected from Hofstee *et al.* (1992), were markers of the high Agreeableness/high Emotional Stability factor: *easy-going, patient, peaceful,* and *tolerant* versus *ill-tempered, irritable, quarrelsome,* and *temperamental*. The remaining eight adjectives, also selected from Hofstee *et al.* (1992), were markers of the high Agreeableness/low Emotional Stability factor: *affectionate, emotional, romantic, sensitive,* and *sentimental* versus *insensitive, unaffectionate,* and *unemotional*.

The mean ratings, shown in Table 2, clearly confirm the expected pattern. Of the eight terms with the highest ratings for Fairness/Non-Exploitation, seven were Honesty adjectives. The mean Fairness/Non-Exploitation rating of the Honesty adjectives was much higher than that of the Agreeableness-plus-Emotional Stability terms ($t(11) = 9.3$, $p < 0.0001$) and that of the Agreeableness-minus-Emotional Stability terms ($t(11) = 10.9$, $p < 0.0001$). Similarly, of the eight terms with the highest ratings for Forgiveness/Non-Retaliation, seven were Agreeableness-plus-Emotional Stability adjectives. The mean Forgiveness/Non-Retaliation rating of the Agreeableness-plus-Emotional Stability adjectives was much higher than that of the Honesty terms ($t(11) = 9.2$, $p < 0.0001$) and that of the Agreeableness-minus-Emotional Stability terms ($t(11) = 8.5$, $p < 0.0001$). Finally, all of the eight terms with the highest ratings for Empathy/Attachment were Agreeableness-minus-Emotional Stability adjectives. The mean Empathy/Attachment rating of the Agreeableness-minus-Emotional Stability adjectives was much higher than that of the Honesty terms ($t(11) = 11.7$, $p < 0.0001$) and that of the Agreeableness-plus-Emotional Stability terms ($t(11) = 9.3$, $p < 0.0001$).

Correlational evidence

Another way to test the proposed interpretations of the lexical Honesty, Agreeableness, and Emotional Stability factors is to find out whether these factors are correlated with scales that assess the proposed constructs. In this section, we focus primarily on the results of studies in which questionnaire markers of the constructs of Fairness versus Exploitation, Forgiveness versus Retaliation, and Empathy/Attachment were correlated with adjective-based markers of the basic dimensions of personality. In addition, we also mention the relations of adjective markers to factors defined by personality questionnaire scales that measure traits similar to the proposed constructs.

Honesty as Fairness (versus Exploitation). The relation between the lexical Honesty factor and questionnaire markers of the Fairness versus Exploitation construct was recently investigated by Ashton *et al.* (2000). In that study, questionnaire scales measuring Machiavellianism (Christie and Geis, 1970), Primary Psychopathy (Levenson, Kiehl and Fitzpatrick, 1995), Social Adroitness (Jackson, 1970, 1994), and Morality (Goldberg, 1999) were used as markers of the willingness versus reluctance to exploit others. The use of these scales is consistent with the content of their items, many of which describe a tendency to cheat, deceive, or manipulate others for personal gain. Moreover, some researchers have explicitly suggested that Machiavellianism or psychopathy can be

Table 2.   Rated relevance of adjectives defining Honesty and rotated variants of Agreeableness and Emotional Stability to three bases of prosocial versus antisocial behaviour

	Fairness/non-exploitation	Forgiveness/non-retaliation	Empathy/attachment
Factor VI adjectives			
Honest	**4.0**	0.4	0.2
Moral	**3.8**	**2.5**	1.0
Fair	**3.2**	0.2	0.0
Trustworthy	**3.2**	0.6	1.2
Egotistical	− 1.2	**− 2.1**	− 1.2
Greedy	**− 2.6**	− 1.6	− 1.2
Dishonest	**− 2.9**	− 0.2	− 0.4
Unfair	**− 3.2**	− 1.8	− 0.4
Absolute mean	***3.0***	*1.2*	*0.7*
Factor II + IV + adjectives			
Tolerant	0.8	**3.8**	0.9
Peaceful	**2.2**	**3.3**	0.4
Easy-going	0.9	**3.0**	0.4
Patient	0.2	**2.2**	1.1
Irritable	− 0.4	**− 2.2**	− 0.6
Temperamental	− 0.7	**− 2.3**	− 0.1
Ill-tempered	− 0.6	**− 2.6**	− 0.9
Quarrelsome	− 1.4	**− 3.7**	− 1.0
Absolute mean	*0.9*	***2.9***	*0.7*
Factor II + IV − adjectives			
Affectionate	0.9	0.8	**3.7**
Sentimental	0.5	0.6	**3.1**
Sensitive	0.8	0.2	**3.0**
Emotional	0.2	0.0	**2.9**
Romantic	0.1	0.2	**2.1**
Unemotional	0.0	− 0.7	**− 3.2**
Insensitive	− 1.2	− 1.1	**− 3.3**
Unaffectionate	− 1.1	− 0.9	**− 3.7**
Absolute mean	*0.6*	*0.6*	***3.1***

N = 12. See the text for a description of the rating task. VI = Honesty; II + IV + = Agreeableness-plus-Emotional Stability; II + IV − = Agreeableness-minus-Emotional Stability. Mean ratings with absolute values of 2.0 or greater are given in bold type.

interpreted as a strategy of unprovoked defection when the likelihood of retaliation is low (e.g. Mealey, 1995; Wilson, Near and Miller, 1996).

The results clearly confirmed the predicted correlations, as all of these questionnaire markers of the Fairness versus Exploitation construct were much more strongly correlated with an adjective Honesty factor than with adjective factors representing any of the Big Five. The Honesty factor correlated − 0.40 with Machiavellianism, − 0.45 with Primary Psychopathy, − 0.43 with Social Adroitness, and − 0.51 with Morality, whereas none of these scales correlated above 0.23 with any of the Big Five factors.

Agreeableness plus Emotional Stability as Forgiveness (versus Retaliation). The relation between the Agreeableness/Emotional Stability plane and the construct of Forgiveness versus Retaliation was tested explicitly by Ashton, Paunonen, Helmes and Jackson (1998), who developed an eight-item questionnaire scale to assess Forgiveness/Non-Retaliation. Results were strongly consistent with the predicted relations, as

Forgiveness/Non-Retaliation correlated 0.50 with a lexical high Agreeableness/*high* Emotional Stability factor, but only 0.17 with a lexical high Agreeableness/ *low* Emotional Stability factor; none of the correlations with other Big Five factors was significant.

Further evidence on the relation between the Agreeableness/Emotional Stability plane and the construct of Forgiveness versus Retaliation comes from the factor analysis of questionnaire scales by Ashton *et al.* (1998a). In that study, one of the obtained factors was chiefly defined by several scales of the Personality Research Form (PRF; Jackson, 1984) whose items describe a tendency to tolerate mistreatment by others versus an inclination to 'get even' for such offenses (specifically, Abasement versus Aggression and Defendence). That factor correlated 0.40 with an adjective Agreeableness factor and 0.40 with an adjective Emotional Stability factor, but did not correlate substantially with any other Big Five factor.

Agreeableness minus Emotional Stability as Empathy/Attachment. The study by Ashton *et al.* (1998b) also included an explicit test of the relation between the Agreeableness/ Emotional Stability plane and the construct of Empathy/Attachment. In that study, an eight-item questionnaire scale measure of Empathy/Attachment was found to correlate 0.50 with the lexical high Agreeableness/*low* Emotional Stability factor (see above), but only -0.02 with the lexical high Agreeableness/*high* Emotional Stability factor; none of the correlations with other Big Five factors was significant.

As was the case for Forgiveness versus Retaliation, above, some additional evidence on the relation between the Agreeableness/Emotional Stability plane and the construct of Empathy/Attachment is found in the article by Ashton *et al.* (1998a). In that study, one of the obtained factors was chiefly defined by several scales from the PRF or the Jackson Personality Inventory (—Revised) (JPI (-R); Jackson, 1970, 1994) whose items describe feelings of empathic concern and emotional attachment toward others (specifically, JPI Interpersonal Affect/JPI-R Empathy, PRF Succorance, and PRF Nurturance versus PRF Autonomy). That factor correlated 0.53 with an adjective Agreeableness factor and -0.41 with an adjective Emotional Stability factor, but did not correlate substantially with any other Big Five factor.

Summary

The semantic and correlational evidence described above clearly supports our interpretation of Honesty and rotated variants of Agreeableness and Emotional Stability as dimensions that underlie individual differences in prosocial versus antisocial tendencies. Apparently, people do use the adjectives that define each of the three axes to describe persons who tend to show the theoretically relevant prosocial tendencies. Also, adjective markers of these three axes are correlated in the predicted pattern with markers of each of the three prosocial tendencies, which are not correlated with adjective markers of the other major factors.

THEORETICAL BASIS OF SURGENCY, CONSCIENTIOUSNESS, AND INTELLECT/IMAGINATION

In the above section, we argued that the dimensions of Honesty, Agreeableness, and Emotional Stability represent personality traits that influence prosocial versus antisocial behaviour. That is, these traits tend to favour both the *expression* of prosocial acts and the *inhibition* of antisocial acts. In this sense, the above traits are neutral with respect to the

individual's overall level of 'engagement' or 'endeavour': these three dimensions do not influence the intensity or amount of behaviour, but rather the interpersonal valence of the behaviour that is performed.

In this section, we propose that the remaining three axes of personality variation—Surgency, Conscientiousness, and Intellect/Imagination—represent dimensions of engagement within three major domains of endeavour. We suggest that the traditional positive pole of each factor represents a greater amount of engagement within a broad domain of endeavour—in other words, a greater intensity of some kind of activity. Specifically, we suggest that Surgency can be interpreted as engagement within social endeavours, that Conscientiousness can be interpreted as engagement within task-related endeavours, and that Intellect/Imagination can be interpreted as engagement within idea-related endeavours. We briefly discuss these interpretations below, before testing the interpretations empirically.

Social, task-, and idea-related engagement/endeavour and the major dimensions of personality

Engagement in social endeavours and Surgency
The Surgency factor is defined strongly and univocally by English-language adjectives such as *talkative, verbal, forward,* and *extraverted* versus *shy, quiet, withdrawn, bashful,* and *introverted* (Hofstee *et al.*, 1992). These terms suggest individual differences in the tendency to become actively engaged in behaviours such as meeting, leading, or entertaining other people. As such, Surgency seems to represent a dimension of social endeavour, representing the extent to which people engage in behaviours that tend to attract social attention.[9]

Engagement in task-related endeavours and Conscientiousness
The Conscientiousness factor is defined strongly and univocally by English-language adjectives such as *organized, orderly, systematic, efficient, practical,* and *meticulous* versus *disorderly, careless, sloppy,* and *absent-minded* (Hofstee *et al.*, 1992). These terms suggest individual differences in the tendency to become actively engaged in behaviours such as planning, organizing, and checking. As such, Conscientiousness seems to represent a dimension of task-related endeavour, representing the extent to which people engage in behaviours that tend to improve efficiency or accuracy in the completion of tasks.

Engagement in idea-related endeavours and Intellect/Imagination
The Intellect/Imagination factor is defined strongly and univocally by English-language adjectives such as *creative, imaginative, philosophical,* and *complex* versus *uncreative* and *unintellectual* (Hofstee *et al.*, 1992). These terms suggest individual differences in the tendency to become actively engaged in behaviours such as imagining, learning, and abstract thinking. As such, Intellect/Imagination seems to represent a dimension of idea-related endeavour, representing the extent to which people engage in behaviours that tend to result in the generation or comprehension of ideas.

---

[9]It should be noted that these terms are neutral in terms of their interpersonal valence, insofar as they do not suggest an imbalance of helpful and harmful acts. In contrast, adjectives that load positively on both Surgency and Agreeableness suggest an element of prosociality (e.g. *cheerful, friendly*), whereas adjectives that load positively on Surgency but negatively on Agreeableness suggest an element of antisociality (e.g. *domineering, combative*). This suggests that Surgency can amplify either prosocial or antisocial tendencies, whose balance is determined by an individual's level of Agreeableness.

We assume that the relevance of the adjectives defining each of the above factors to the domains of social, task-related, and idea-related endeavour is sufficiently obvious that an empirical demonstration of this semantic overlap is unnecessary. In the section below, we focus instead on other factor-analytic evidence that the three factors represent axes of active engagement within each domain of endeavour.

Evidence for the proposed interpretations

In this section, we test the interpretation of the Surgency, Conscientiousness, and Intellect/ Imagination factors as axes of engagement within social, task-related, and idea-related domains of endeavour, respectively. First, we examine the factor loading patterns of variables that represent a construct of overall engagement or endeavour. Second, we consider the content of variables that load strongly on each of the three factors individually.

Overall engagement/endeavour

The interpretation of Surgency, Conscientiousness, and Intellect/Imagination as dimensions of domain-specific engagement or endeavour generates some predictions regarding some traits that should define all three factors jointly. One clear implication is that all three factors should be defined by traits that involve an overall tendency to become intensely engaged, and to expend a great deal of effort, within potentially rewarding endeavours. In other words, we should expect modest positive loadings on all three factors for traits suggesting a high level of activity, ambition, and motivation.[10] Moreover, such traits should be nearly independent of the remaining personality factors, which we view as being largely unrelated to the tendency to invest energy within various domains of endeavour.

PRF Achievement and JPI Energy Level. Two variables that seem to represent the construct of overall engagement or endeavour very closely are the PRF Achievement and JPI Energy Level scales. PRF Achievement contains items that describe a competitive desire to succeed, a tendency to pursue difficult goals, and a tendency to become deeply absorbed in hard work; Jackson (1984, p. 6) describes high scorers as those who are 'willing to put forth effort to attain excellence'. JPI Energy Level contains items that describe a preference for vigorous activity and for being busy, as well as the tendency to perform 'intense work or recreational activity for long periods of time' (Jackson, 1994, p. 5); however, a few of the reverse-keyed items describe complaints of fatigue rather than an absence of active engagement.

We first tested the prediction that variables related to overall engagement or endeavour should load on Surgency, Conscientiousness, and Intellect/Imagination by using the results of the factor analysis of 36 PRF and JPI scales reported by Ashton *et al.* (1998a). Within that data set, three of the obtained factors showed strong and nearly isomorphic relations with adjective markers of the Big Five Surgency, Conscientiousness, and Intellect/Imagination factors; also, the remaining two factors, when rotated by 45 degrees, showed similarly clear relations with Agreeableness and Emotional Stability (see Ashton *et al.*, 1998a, Table 2, and p. 247).

The loadings of Achievement and Energy Level on the obtained factors were largely consistent with the claim that Surgency, Conscientiousness, and Intellect/Imagination

---

[10]This is *not* to suggest that there exists a higher-order factor of engagement or endeavour. Even though we claim that active engagement is a common denominator among these factors, the correlations among them need not be large or even positive, due to competition among the three domains of endeavour for finite resources of time and energy.

Table 3. Projections of Achievement and Energy/Activity scales on Big Five personality factors

	I	III	V	II	IV
Loadings on Big Five[a]					
PRF Achievement	0.20	0.56	0.42	0.02	0.05
JPI Energy Level	0.48	0.30	0.34	0.04	0.30
Mean	*0.34*	*0.43*	*0.39*	*0.03*	*0.18*
Correlations with Big Five[b]					
NEO-PI-R Achievement Striving	0.27	0.40	0.15	−0.10	0.09
NEO-PI-R Activity	0.43	0.20	0.19	−0.05	0.00
Mean	*0.35*	*0.30*	*0.17*	*−0.08*	*0.04*
Mean of PRF/JPI, NEO-PI-R projections					
Achievement	0.24	0.48	0.28	−0.04	0.07
Energy/Activity	0.46	0.25	0.28	0.00	0.15
Mean	*0.34*	*0.36*	*0.28*	*−0.02*	*0.11*

I = Surgency; III = Conscientiousness; V = Intellect/Imagination; II = Agreeableness; IV = Emotional Stability.
[a] $N = 528$, from Ashton *et al.* (1998a). [b] $N = 841$, from L. R. Goldberg (personal communication, 2001).

represent dimensions of domain-specific engagement or endeavour (see Table 3). Achievement and Energy Level were the only two PRF/JPI scales to load at least 0.20 on all three of these factors: the loadings for Achievement were 0.20 (Surgency), 0.56 (Conscientiousness), and 0.42 (Intellect/Imagination); the corresponding loadings for Energy Level were 0.48, 0.30, and 0.34.

The loadings of these scales on the other factors tended to be lower. Achievement loaded 0.02 on Agreeableness and 0.05 on Emotional Stability, whereas Energy Level loaded 0.04 on Agreeableness and 0.30 on Emotional Stability. The moderate loading of Energy Level on Emotional Stability may be attributable to the reverse-keyed items that describe complaints of fatigue; this possibility will be tested, below, by considering another marker of Energy or Activity that excludes such content.

NEO-PI-R Achievement Striving and Activity. A further test of the engagement/ endeavour interpretation of Surgency, Conscientiousness, and Intellect/Imagination is available using data kindly provided by L. R. Goldberg (personal communication, 2001), who correlated the 30 facet scales of the NEO-PI-R with adjective markers of the Big Five (Goldberg, 1992).[11] Two of the NEO-PI-R scales—Achievement Striving and Activity— are similar in content to PRF Achievement and JPI Energy Level, respectively. Within this data set, Achievement Striving correlated 0.27 with Surgency, 0.40 with Conscientiousness, and 0.15 with Intellect/Imagination; the corresponding correlations for Activity were 0.43, 0.20, and 0.19 (see Table 3).[12] In terms of discriminant correlations, Achievement

[11]We used the NEO-PI-R scales' correlations with the lexical Big Five, rather than the loadings of those scales in factor analyses of the NEO-PI-R, because of the apparent differences in rotational orientation between the NEO-PI-R and lexical factors in the Surgency/Agreeableness plane, and the apparent differences between NEO-PI-R Openness to Experience and lexical Intellect/Imagination (see e.g., Goldberg, 1993).
[12]Of the other 28 facets within the NEO-PI-R variable set, only the Assertiveness scale had its three highest Big Five correlations with these three factors, correlating 0.60 with Surgency, 0.14 with Conscientiousness, and 0.23 with Intellect/Imagination. This scale also correlated only − 0.13 with Agreeableness and 0.05 with Emotional Stability. Its counterpart in the PRF/JPI variable set, PRF Dominance, also loaded positively on Surgency (0.62), Conscientiousness (0.18), and Intellect/Imagination (0.23), but also loaded negatively on Agreeableness (− 0.33) and showed a small positive loading on Emotional Stability (0.12). The loadings of assertiveness or dominance on the three engagement/endeavour-related factors are quite consistent with our interpretation, given the conceptual link between the tendency to 'take charge' of situations and the activity, ambition, and motivation that characterize overall engagement or endeavour. Moreover, leadership presumably involves small elements of task- and idea-related endeavour, in addition to the predominant element of social endeavour.

Striving was nearly uncorrelated with both Agreeableness (-0.10) and Emotional Stability (0.09); the correlations of Activity with these factors were even weaker, -0.05 and 0.00. The zero correlation between NEO-PI-R Activity and Emotional Stability, in contrast to the positive loading of JPI Energy Level on that factor, probably reflects the absence of fatigue-related items in the NEO-PI-R Activity scale.

Averaged values. Averaging the values for the two Achievement scales and the two Energy/Activity scales further clarifies this pattern of results. As seen in Table 3, the two Achievement scales had an average projection of 0.24 on Surgency, 0.48 on Conscientiousness, and 0.28 for Intellect/Imagination, but only -0.04 on Agreeableness and 0.07 on Emotional Stability. Similarly, the two Energy/Activity scales had averaged projections of 0.46 on Surgency, 0.25 on Conscientiousness, and 0.28 on Intellect/Imagination, but only 0.00 on Agreeableness and 0.15 on Emotional Stability.[13]

Thus, the interpretations of Surgency, Conscientiousness, and Intellect/Imagination as dimensions of engagement within domain-specific endeavours are supported by the finding that variables representing overall engagement or endeavour—specifically, scales assessing Achievement and Energy/Activity—showed moderate positive projections on those three factors, but had very low projections on the remaining personality dimensions. These interpretations also require, however, that the variables with the highest projections on each of the three individual factors can be shown to represent markers of endeavour within the social, task-related, and idea-related domains of endeavour, respectively. We now show, with reference to the scales of the PRF, the JPI(-R), and the NEO-PI-R, that the personality variables that define these three dimensions most strongly are clearly interpretable in terms of active engagement within the relevant domains of endeavour.

Surgency, Conscientiousness, and Intellect/Imagination as domain-specific engagement/endeavour

Surgency as engagement within social endeavours. The interpretation of Surgency as an axis of active engagement within social endeavours is strongly supported by the content of two scales—PRF Exhibition and JPI Self-Esteem/JPI-R Social Confidence—that are strongly correlated with Surgency (Ashton *et al.*, 1998a). According to Jackson's (1984, p. 6) scale definitions, a person high in the need for Exhibition 'wants to be the center of attention; enjoys having an audience; engages in behaviour which wins the notice of others; may enjoy being dramatic or witty'. Similarly, the items of the Self-Esteem/Social Confidence scale describe behaviours that clearly involve active social endeavour, such as leading groups of people, striking up conversations, introducing oneself to strangers, and expressing opinions.

Whereas personality scales that directly involve social endeavour show very high loadings on Surgency, scales that merely describe a dislike for being alone show much more modest loadings on that factor. For example, the JPI Social Participation/JPI-R Sociability scale contains several items that do not describe active social endeavour, but instead describe feelings of loneliness or sadness when not in the company of other people.

---

[13]No sixth factor was reported in either data set. However, the JPI Social Adroitness scale (which had the lowest communality of all scales in the PRF/JPI factor analysis) is substantially negatively correlated with lexical Honesty (Ashton *et al.*, 2000, Table 2). Social Adroitness correlated only 0.04 with Achievement and 0.03 with Energy Level, suggesting that those scales are independent of the sixth factor. Similarly, a parallel form of NEO-PI-R Straightforwardness—Goldberg's (1999) Morality scale—is substantially correlated with lexical Honesty (Ashton *et al.*, 2000, Table 2), whereas Straightforwardness correlated only 0.04 with Achievement Striving and -0.11 with Activity within the NEO-PI-R normative sample (Costa and McCrae, 1992).

Interestingly, Ashton *et al.* (1998a) found that this scale showed only a moderate loading on Surgency, and loaded slightly more highly on the high Agreeableness/low Emotional Stability factor, which we interpret as a dimension of empathic concern and emotional attachment.

The above findings are consistent with those involving NEO-PI-R Extraversion facet scales (L. R. Goldberg, personal communication, 2001). The facet that correlated most strongly with Surgency was Assertiveness (0.60), whose items describe a tendency to assume positions of leadership; in contrast, Surgency correlated somewhat less strongly with Gregariousness (0.44), which assesses, in part, the need to have the company of others.

Conscientiousness as engagement within task-related endeavours. The construct of engagement within task-related endeavours closely matches the item content of scales such as JPI Organization, PRF Order, and NEO-PI-R Order, which are strongly correlated with Conscientiousness (see e.g. Ashton *et al.*, 1998a; L. R. Goldberg, personal communication, 2001). For example, Jackson (1994, p. 23) stated that 'A person who scores highly on [the JPI Organization] scale is inclined to plan ahead and to complete assignments on schedule. A person who scores low on Organization may be inclined to leave things until the last minute, and to avoid structure in work activities'. The items of these scales also describe attempts to maintain the order of one's possessions and physical surroundings, and thus assess the investment of time and energy in tasks that are aimed at optimizing the use of one's material resources.

Another variable that strongly defines the negative pole of Conscientiousness is PRF Impulsivity (Ashton *et al.*, 1998a). The relevance of impulse control to the construct of engagement within task-related endeavours might not be immediately obvious, but can be illustrated with reference to the distinction between dysfunctional and functional impulsivity (Dickman, 1990). Dysfunctional impulsivity involves a tendency to act without thorough consideration of one's options, whereas functional impulsivity involves a tendency to think quickly and to take advantage of unexpected opportunities. PRF Impulsivity, whose item content resembles the former construct, is much more strongly correlated with the dysfunctional variant of impulsivity than with the functional variant (Dickman, 1990), and thus can be interpreted as a lack of engagement in the tasks of planning ahead and making decisions. Similar interpretations could be made of the low poles of other scales, such as PRF Cognitive Structure or NEO-PI-R Deliberation, that assess thoroughness of planning and decision-making.

Intellect/Imagination as engagement within idea-related endeavours. The variables that define the Intellect/Imagination factor most strongly are clearly relevant to the construct of engagement within idea-related endeavours. Several scales that are strongly correlated with this factor—including NEO-PI-R Openness to Ideas, JPI Breadth of Interest, PRF Understanding, JPI Complexity, and JPI Innovation (Ashton *et al.*, 1998a; L. R. Goldberg, personal communication, 2001)—were developed to assess intellectual curiosity, cognitive complexity, and creativity. As such, these variables directly represent engagement within endeavours that are aimed at the comprehension or generation of ideas.

Other variables that show moderately strong relations with the Intellect/Imagination factor include PRF Sentience and the NEO-PI-R facets of Openness to Fantasy, Aesthetics, and Feelings (see e.g. Ashton *et al.*, 1998a; L. R. Goldberg, personal communication, 2001). At first glance, these traits might not seem to involve active engagement within idea-related endeavours. However, the above scales assess constructs of aesthetic appreciation and imagination that are highly reminiscent of the Absorption scale of

Tellegen and Atkinson (1974), with which these scales are highly correlated (see e.g. McCrae, 1993–94, Table 4). Tellegen and Atkinson (1974, p. 274) describe Absorption in terms that strongly imply effortful engagement: 'the attention described in Absorption items is a "total" attention, involving a *full commitment of available perceptual, motoric, imaginative, and ideational resources to a unified representation of the attentional object*' (italics in original), which may be, for example, 'a landscape, a human being, a sound, a remembered incident, or an aspect of one's self'. This interpretation further supports our claim that the constructs that define Intellect/Imagination involve active engagement within idea-related endeavours.

Summary

The evidence described above is consistent with our interpretations of the Surgency, Conscientiousness, and Intellect/Imagination factors as dimensions of engagement within social, task-related, and idea-related domains of endeavour, respectively. First, markers of overall engagement/endeavour load on all three factors, but not on the remaining personality factors. Also, the variables that load most strongly on each of the three individual factors are those whose item content describes active engagement within the appropriate domain of endeavour.

GENERAL DISCUSSION

Novelty of the predictions generated by the proposed interpretations

The aim of this paper has been to describe and to test a theory of the major dimensions of personality variation. On the basis of the arguments and evidence described above, we claim that there are two important strengths to this theory.

First, the proposed framework provides links between the major dimensions of personality and the major sources of prosocial versus antisocial behaviours—namely, reciprocal altruism and kin-based altruism—that have been postulated by evolutionary biologists. Consistent with our predictions, we have found that the Honesty factor corresponds to the reciprocity-related construct of Fairness (versus Exploitation), that the Agreeableness-plus-Emotional Stability axis corresponds to the other reciprocity-related construct of Forgiveness (versus Retaliation), and that the Agreeableness-minus-Emotional Stability axis corresponds to the kin-altruism-related construct of Empathy/Attachment.[14] Thus, this part of the model not only provides a theoretical basis for two of the Big Five factors, but *it also requires the existence of the sixth factor that has in fact emerged from lexical studies of personality structure in several languages*. It seems unlikely that any competing explanation of the Big Five factors, should one be forthcoming, would predict the emergence of an Honesty-like construct as the sixth factor of personality.

---

[14]The above framework might help to explain patterns of sex differences in the major dimensions of personality. Apparently, these differences are largely restricted to (a) the high Agreeableness/low Emotional Stability axis (see e.g. Ashton *et al.*, 1998a, 1998b; Costa and McCrae, 1992, p. 55), on which women average nearly a standard deviation higher than men, and to (b) the Honesty factor, on which the sex difference is almost as large, with women again averaging higher than men (based on results for Primary Psychopathy from Levenson *et al.*, 1995, Table 3). The former difference may be a reflection of the typically greater parental care provided by women, and the latter difference may be a reflection of the higher maximum possible level of reproductive success among men.

Second, the proposed framework provides a common basis for understanding the dimensions of Surgency, Conscientiousness, and Intellect/Imagination, by explaining them as axes of engagement within social, task-related, and idea-related domains of endeavour. We have argued that the personality variables defining each factor are readily interpretable as markers of domain-relevant engagement or endeavour, and we have also found, consistent with our predictions, that personality variables best interpreted as markers of overall engagement or endeavour—scales measuring Achievement and Energy/Activity—show positive loadings on these three factors, but tend not to load on the remaining factors. Again, it seems unlikely that this latter finding would be predicted by any other theory that might be put forth as an explanation of the major dimensions of personality.

Other interpretations of major personality dimensions

Positive and negative emotionality

Some researchers have suggested that factors similar to Surgency and low Emotional Stability (i.e. Extraversion and Neuroticism) can be explained as dimensions of trait positive affect and trait negative affect, respectively (e.g. Watson and Clark, 1992). With regard to the major personality dimensions obtained from lexical studies, one might question this interpretation on the grounds that the Surgency factor is defined more strongly by social-endeavour-related terms (e.g. *talkative, verbal* versus *shy, withdrawn*) than by terms suggesting positive affect. The latter terms, which are heavily represented in lexical studies, are not a unified set whose members define the Surgency factor univocally and strongly; they are instead a diffuse collection whose members load on Surgency and on other factors (see e.g. Hofstee *et al.*, 1992), such as Agreeableness (e.g. *cheerful, effervescent, enthusiastic, happy, joyful, merry*), Emotional Stability (e.g. *bold, brave, confident, courageous, strong*), or Conscientiousness (e.g. *active, alert*); see also the regression weights reported by Watson and Clark (1992, Table 4). On the other hand, it is not entirely implausible that some rotation of the obtained lexical axes would produce dimensions that could be unambiguously interpreted as positive and negative affect. However, this interpretation leaves unexplained the remaining four re-rotated dimensions, whose content (and interpretation) would probably be rather complex as a result of the re-orientation of axes.

In terms of the framework described in this article, positive and negative emotions can be viewed as 'general behavioral energizers' (MacDonald, 1995, p. 540) that catalyse behaviours relevant to several major dimensions of personality. For example, positive emotionality may serve to promote socially active behaviour (particularly that of the prosocial variety) or to promote task-related endeavour. Similarly, negative emotionality may serve to promote prosocial behaviour when family or friends are in distress, to promote antisocial behaviour in response to aggression, or to inhibit socially active behaviour when this is potentially dangerous (see Ashton *et al.*, 1998b).

Interpersonal circles

Another partial framework for understanding the major dimensions of personality involves the plane spanned by Surgency and Agreeableness. According to this interpretation, these two dimensions can be understood as the major axes of interpersonal behaviour (see e.g. Trapnell and Wiggins, 1990). We view this interpretation as one that is nicely consistent with, and one that can be subsumed within, our own framework. Recall that our model

describes three axes of prosocial versus antisocial tendencies. Two of these correspond to mixtures of Agreeableness and either high or low Emotional Stability, whereas the third corresponds to Honesty, which seems to absorb some variance from the broad Agreeableness factor of solutions involving only four or five factors (see e.g. Angleitner and Ostendorf, 1989; Szirmak and De Raad, 1994). Thus, within our framework, this broad variant of the Agreeableness factor combines the three dimensions to produce an axis of overall prosocial versus antisocial behaviour, or what might also be termed the *valence* of social behaviour. Recall also that, according to our framework, Surgency represents a dimension of engagement within social endeavours, or what might also be termed the *intensity* of social behaviour. In this sense, the interpretation of Agreeableness and Surgency as the dimensions of the interpersonal circle is congruent with our own interpretation of these axes as representing, respectively, a compound of three dimensions related to prosocial versus antisocial tendencies, and a dimension of social engagement or endeavour.

Higher-order factors?

We should emphasize that our interpretation of the six personality factors in terms of two broad categories—prosocial versus antisocial tendencies and engagement/endeavour—is not intended as a suggestion either that prosociality and engagement/endeavour should represent two higher-order factors, or that the dimensions of a two-factor solution should correspond to these categories. There are two reasons why the conceptual grouping of the factors would not necessarily correspond to the correlational grouping of the factors.

First, competition among the aspects of prosociality, or of engagement/endeavour, might keep the correlations within each group very small, or even negative. Perhaps the clearest case of this concerns the constructs of empathy/attachment and forgiveness/non-retaliation. Even though both of these constructs are thought to underlie prosocial tendencies, they also involve *opposing* levels of susceptibility to negative emotions. Thus, these two constructs might be expected to be uncorrelated, as indeed they seem to be (Ashton *et al.*, 1998b). A similar situation may apply with regard to the three constructs interpreted in terms of engagement or endeavour. All three constructs involve a common element of expending time and energy, but it seems entirely plausible that these domains would compete for limited resources of time and energy. For example, given a fixed amount of time and energy, the more heavily one engages in social endeavours, the less heavily one can engage in task- and idea-related endeavours. Individual differences in overall levels of activity, ambition, or motivation might not be large enough to overcome this antagonism and to allow substantial positive intercorrelations among the three domains of engagement/endeavour.

Second, correlations might well be expected between constructs interpreted in terms of prosociality and those interpreted in terms of engagement/endeavour. This could result from, among other things, a common suffusion with variance due to socialization and/or to social desirability. For example, both task-related endeavour (Conscientiousness) and overall prosociality (broad Agreeableness) tend to be evaluated positively, whereas social endeavour (Surgency) is evaluated more neutrally. This might result in a higher correlation between Conscientiousness and Agreeableness than between Conscientiousness and Surgency, with the consequence that Conscientiousness would join with Agreeableness, not Surgency, within a two-factor solution. In fact, our findings in French (Boies *et al.*, in press) and in Korean (Hahn *et al.*, 1999) suggest that the first unrotated factor typically

is defined by adjectives that load on Agreeableness, Conscientiousness, Emotional Stability, and Honesty, and that the second unrotated factor often corresponds fairly closely to Surgency. This probably reflects the fact that the former factors all refer to socially approved characteristics (see Footnote 5), whereas the social desirability of Surgency tends to be more ambiguous.[15]

Future research might profitably examine relations between the major personality factors discussed in this paper and the personality types as revealed by the person-centred approach to personality structure. Person-centred analyses (see e.g. Mervielde and Asendorpf, 2000) have revealed three broad personality types: undercontrollers, who are characterized by externalizing problems (low Agreeableness, low Conscientiousness); overcontrollers, who are characterized by internalizing problems (low Surgency, low Emotional Stability); and resilients, who are characterized by an absence of these problems. (This result is consistent with the above-noted finding that Conscientiousness tends to group with Agreeableness, rather than with Surgency.) As noted by Mervielde and Asendorpf (2000), these categories are too broad for highly differentiated descriptions, but will provide an excellent basis for future differentiation of coherent personality types. The relation of those types to the major personality dimensions obtained from variable-centred methods, and to the theoretical framework proposed here, may provide some interesting avenues for future research.

CONCLUSION

On the basis of the arguments and evidence described in this paper, we conclude the following. First, lexical studies of personality structure suggest that a six-dimensional taxonomy of personality variation provides the most parsimonious and comprehensive framework for understanding the structure of personality characteristics. Second, three of these six dimensions—Honesty and rotated variants of Agreeableness and Emotional Stability—can be interpreted as three traits—fairness/non-exploitation, forgiveness/non-retaliation, and empathy/ attachment—that underlie prosocial versus antisocial behaviour. Third, the other three dimensions—Surgency, Conscientiousness, and Intellect/Imagination—can be interpreted as three traits that involve active engagement within social, task-related, and idea-related domains of endeavour, respectively.

ACKNOWLEDGEMENT

---

[15]We should add that the issue of higher-order factors, or of factor solutions involving smaller numbers of factors, is perhaps not particularly important. Each of the six factors accounts independently for a sizable proportion of personality variance. Any attempt to reduce these six dimensions to one or two larger dimensions will only be accomplished at the loss of a great deal of that variance. Moreover, those larger dimensions might be fairly heavily saturated with variance due to response styles, such as social desirability.

REFERENCES

Almagor M, Tellegen A, Waller NG. 1995. The Big Seven model: a cross-cultural replication and further exploration of the basic dimensions of natural language trait descriptors. *Journal of Personality and Social Psychology* **69**: 300–307.

Angleitner A, Ostendorf F. 1989. Personality factors via self- and peer-ratings based on a representative sample of German trait descriptive terms. Paper prepared for the First European Congress of Psychology, Amsterdam.

Ashton MC. 1998. Personality and job performance: the importance of narrow traits. *Journal of Organizational Behavior* **19**: 289–303.

Ashton MC, Jackson DN, Helmes E, Paunonen SV. 1998a. Joint factor analysis of the Personality Research Form and the Jackson Personality Inventory: comparisons with the Big Five. *Journal of Research in Personality* **32**: 243–250.

Ashton MC, Lee K, Son C. 2000. Honesty as the sixth factor of personality: correlations with Machiavellianism, Primary Psychopathy, and Social Adroitness. *European Journal of Personality* **14**: 359–368.

Ashton MC, Paunonen SV, Helmes E, Jackson DN. 1998b. Kin altruism, reciprocal altruism, and the Big Five personality factors. *Evolution and Human Behavior* **19**: 243–255.

Axelrod R. 1984. *The Evolution of Co-Operation*. Basic: New York.

Batson CD, Duncan BD, Ackerman P, Buckley T, Birch K. 1981. Is empathic emotion a source of altruistic motivation? *Journal of Personality and Social Psychology* **40**: 290–302.

Batson CD, Sager K, Garst E, Kang M, Rubchinsky K, Dawson K. 1997. Is empathy-induced helping due to self–other merging? *Journal of Personality and Social Psychology* **73**: 495–509.

Batson CD, Turk CL, Shaw LL, Klein TR. 1995. Information function of empathic emotion: learning that we value the other's welfare. *Journal of Personality and Social Psychology* **68**: 300–313.

Benet V, Waller NG. 1995. The big-seven factor model of personality description: evidence for its cross-cultural generality in a Spanish sample. *Journal of Personality and Social Psychology* **69**: 701–718.

Boies K, Lee K, Ashton MC, Pascal S, Nicol AAM. 2001. The structure of the French personality lexicon. *European Journal of Personality* **15**: 277–295.

Caprara GV, Perugini M. 1994. Personality described by adjectives: generalizability of the Big Five to the Italian lexical context. *European Journal of Personality* **8**: 357–369.

Christie R, Geis FL. 1970. *Studies in Machiavellianism*. Academic: New York.

Church AT, Katigbak MS, Reyes JAS. 1998. Further exploration of Filipino personality structure using the lexical approach: do the big-five or big-seven dimensions emerge? *European Journal of Personality* **12**: 249–269.

Church AT, Reyes JAS, Katigbak MS, Grimm SD. 1997. Filipino personality structure and the Big Five: a lexical approach. *Journal of Personality* **65**: 477–528.

Cialdini RB, Brown SL, Lewis BP, Luce C, Neuberg SL. 1997. Reinterpreting the empathy–altruism relationship: when one into one equals oneness. *Journal of Personality and Social Psychology* **73**: 481–494.

Costa PT Jr, McCrae RR. 1992. *NEO Personality Inventory—Revised (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) Professional Manual*. Psychological Assessment Resources: Odessa, FL.

De Raad B. 1992. The replicability of the Big Five personality dimensions in three word-classes of the Dutch language. *European Journal of Personality* **6**: 15–29.

De Raad B, Hendriks AAJ, Hofstee WKB. 1992. Towards a refined structure of personality traits. *European Journal of Personality* **6**: 301–319.

De Raad B, Perugini M, Hrebickova M, Szarota P. 1998. Lingua franca of personality: taxonomies and structures based on the psycholexical approach. *Journal of Cross-Cultural Psychology* **29**: 212–232.

De Raad B, Szirmak Z. 1996. 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**: 17–24.

Di Blas L, Forzi M. 1998. An alternative taxonomic study of personality-descriptive adjectives in the Italian language. *European Journal of Personality* **12**: 75–101.

Di Blas L, Forzi M. 1999. Refining a descriptive structure of personality attributes in the Italian language. *Journal of Personality and Social Psychology* **76**: 451–481.

Di Blas L, Forzi M, Peabody D. 2000. Evaluative and descriptive dimensions from Italian personality factors. *European Journal of Personality* **14**: 279–290.

Dickman SJ. 1990. Functional and dysfunctional impulsivity: personality and cognitive correlates. *Journal of Personality and Social Psychology* **58**: 95–102.

Eysenck HJ. 1947. *Dimensions of Personality*. Routledge and Kegan Paul: London.

Goldberg LR. 1990. An alternative 'description of personality': the Big-Five factor structure. *Journal of Personality and Social Psychology* **59**: 1216–1229.

Goldberg LR. 1992. The development of markers for the Big-Five factor structure. *Psychological Assessment* **4**: 26–42.

Goldberg LR. 1993. The structure of phenotypic personality traits. *American Psychologist* **48**: 26–34.

Goldberg LR. 1999. A broad-bandwidth, public-domain, personality inventory measuring the lower-level facets of several five-factor models. In *Personality Psychology in Europe*, Vol. 7, Mervielde I, Deary I, De Fruyt F, Ostendorf F (eds). Tilburg University Press: Tilburg, The Netherlands; 7–28.

Goldberg LR, Somer O. 2000. The hierarchical structure of common Turkish person-descriptive adjectives. *European Journal of Personality* **14**: 497–531.

Hahn D-W, Lee K, Ashton MC. 1999. A factor analysis of the most frequently used Korean personality trait adjectives. *European Journal of Personality* **13**: 261–282.

Hamilton WD. 1964. The genetical evolution of social behavior. I, II. *Journal of Theoretical Biology* **7**: 1–52.

Harpur TJ, Hare RD, Hakstian AR. 1989. Two-factor conceptualization of psychopathy: construct validity and assessment implications. *Psychological Assessment* **1**: 6–17.

Hofstee WKB, De Raad B, Goldberg LR. 1992. Integration of the Big Five and circumplex approaches to trait structure. *Journal of Personality and Social Psychology* **63**: 146–163.

Hrebickova M. 1995. *The Structural Model of Personality Based on the Lexical Analysis: A Czech Replication Study of the Five-Factor Model Based on a Comprehensive Taxonomy of Personality-Descriptive Adjectives*. Institute of Psychology, Academy of Sciences of the Czech Republic: Brno.

Hwang P, Burgers WP. 1997. Properties of trust: an analytical review. *Organizational Behavior and Human Decision Processes* **69**: 67–73.

Jackson DN. 1970. *Jackson Personality Inventory Manual*. Research Psychologists Press: Port Huron, MI.

Jackson DN. 1984. *Personality Research Form Manual 3rd edn*. Research Psychologists Press: Port Huron, MI.

Jackson DN. 1994. *Jackson Personality Inventory—Revised Manual*. Sigma Assessment Systems: Port Huron, MI.

Jackson DN, Messick S. 1958. Content and style in personality assessment. *Psychological Bulletin* **55**: 243–252.

John OP, Robins RW. 1994. Accuracy and bias in self-perception: individual differences in self-enhancement and narcissism. *Journal of Personality and Social Psychology* **66**: 206–219.

Krebs D. 1975. Empathy and altruism. *Journal of Personality and Social Psychology* **32**: 1134–1146.

Levenson MR, Kiehl KA, Fitzpatrick CM. 1995. Assessing psychopathic attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology* **68**: 151–158.

MacDonald K. 1995. Evolution, the Five-Factor Model, and levels of personality. *Journal of Personality* **63**: 525–567.

McCrae RR. 1993–94. Openness to Experience as a basic dimension of personality. *Imagination, Cognition, and Personality* **13**: 39–55.

Mealey L. 1995. The sociology of sociopathy: an integrated evolutionary model. *Behavioral and Brain Sciences* **18**: 523–599.

Mervielde I, Asendorpf JB. 2000. Variable-centred and person-centred approaches to childhood personality. In *Advances in Personality Psychology*, Hampson SE (ed.). Psychology Press: Philadelphia, PA; 37–76.

Nowak M, Sigmund K. 1993. A strategy of win–stay, lose–shift that outperforms tit-for-tat in the Prisoner's Dilemma game. *Nature* **364**: 56–58.

Ostendorf F, Angleitner A. 1993. A German replication study of the Five-Factor Model based on a comprehensive taxonomy of personality-descriptive adjectives. Paper presented at the Sixth Meeting of the International Society for the Study of Individual Differences, Baltimore, MD.

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

Peabody D, Goldberg LR. 1989. Some determinants of factor structures from personality-trait descriptors. *Journal of Personality and Social Psychology* **57**: 552–567.

Rapoport A, Chammah AM. 1965. *Prisoner's Dilemma*. University of Michigan Press: Ann Arbor, MI.

Rushton JP, Russell RJH, Wells PA. 1984. Genetic similarity theory: beyond kin-selection altruism. *Behavioral Genetics* **14**: 179–193.

Saucier G. 1997. Effects of variable selection on the factor structure of person descriptors. *Journal of Personality and Social Psychology* **73**: 1296–1312.

Saucier G, Goldberg LR. 1996a. The language of personality: lexical perspectives on the five-factor model. In *The Five-Factor Model of Personality: Theoretical Perspectives*, Wiggins JS (ed.). Guilford: New York; 21–50.

Saucier G, Goldberg LR. 1996b. Evidence for the Big Five in analyses of familiar English personality adjectives. *European Journal of Personality* **10**: 61–77.

Somer O, Goldberg LR. 1999. The structure of Turkish trait-descriptive adjectives. *Journal of Personality and Social Psychology* **76**: 431–450.

Szarota P. 1996. Taxonomy of the Polish personality-descriptive adjectives of the highest frequency of use. *Polish Psychological Bulletin* **27**: 343–351.

Szirmak Z, 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, Atkinson G. 1974. Openness to absorbing and self-altering experiences ('absorption'), a trait related to hypnotic susceptibility. *Journal of Abnormal Psychology* **83**: 268–277.

Trapnell PD, Wiggins JS. 1990. Extension of the Interpersonal Adjective Scales to include the Big Five dimensions of personality. *Journal of Personality and Social Psychology* **59**: 781–790.

Trivers RL. 1971. The evolution of reciprocal altruism. *Quarterly Review of Biology* **46**: 35–57.

Watson D, Clark LA. 1992. On traits and temperament: general and specific factors of emotional experience and their relation to the five-factor model. *Journal of Personality* **60**: 441–476.

Wilson DS, Near D, Miller RR. 1996. Machiavellianism: a synthesis of the evolutionary and psychological literatures. *Psychological Bulletin* **119**: 285–299.