

## The Five-Factor Personality Inventory (FFPI)

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### Abstract

The Five-Factor Personality Inventory (FFPI) assesses the Big Five factors of personality, both for self-ratings and for others' ratings. It consists of 100 brief and concrete statements, and can be administered in 10-15 minutes. In addition to the five factor scores, the FFPI may be used to assess 40 bipolar facet scores that arise as blends of the Big Five, for the purpose of communicating more specific information about an individual's position in the five-space (applied settings). In the normal population, the five factor scores appear to be internally consistent, stable, and valid. As regards specific (e.g., clinical) populations, still further study is needed. The item pool for the FFPI was constructed interactively in Dutch, English, and German versions, and proved to be relatively easy to translate into still other languages. Presently also available are the Brazilian, Chinese, Croatian, Hebrew, Hungarian, Italian, Japanese, Polish, Slovak, Spanish, and Swedish versions.

## The Five-Factor Personality Inventory (FFPI)

The Five-Factor Personality Inventory (FFPI) results from an attempt to construct a state-of-the-art instrument for the assessment of the Big Five (see, e.g., Digman, 1990; Goldberg, 1992; John, 1990) factors of personality, either through self-ratings or, preferably (Hofstee, 1994), through ratings by a number of others who know the target person well. The start of the project was inspired by a refinement of the classical Big Five simple-structure representation of personality traits into the Abridged Big-Five Dimensional Circumplex (AB5C; Hofstee, De Raad, & Goldberg, 1992) model that integrates simple-structure and circumplex representations. In the AB5C model, the five-dimensional trait sphere is partitioned into 90 'facets', by clustering traits according to their two highest (out of five) loadings. These 90 clusters are much more homogeneous in meaning than the five broad clusters in the Big Five simple-structure model. The AB5C model therefore better represents nuances in trait meaning and so offers an excellent starting point to construct items for an inventory that covers (specific parts of) the trait sphere.

More precisely, it invited us to construct concrete behavioral sentence items<sup>1</sup> in order to arrive at a Big Five instrument fit for a broad range of educational levels. The lower the level of education, the lesser trait adjectives can be expected to serve the purpose of assessing a person's standing on personality dimensions, because adjectives are abstract terms. Indeed, at a later stage of the project, we empirically confirmed that many trait adjectives are unfamiliar to the less high-educated respondent, whereas on the whole behavioral translations of trait adjectives are not (Hendriks, 1997).

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<sup>1</sup>Contrary to the conviction of one of the reviewers, the authors do not adhere to the lexical hypothesis in its strongest (single-word) formulation. It is not to be denied that the five-factor model originates from studies on personality trait adjectives. However, the model was found to hold also for the domain of theory-driven personality questionnaires (Digman, 1990; Digman & Inouye, 1986) and temperament inventories (Angleitner & Ostendorf, 1991).

To construct a Big Five inventory that consists of sentence items is not unique in itself. The NEO-PI-R (Costa & McCrae, 1992) is a well-known exemplar and becoming more widely available through translations each year. However, we had good reasons to construct a competitor. The NEO-PI-R, like other personality inventories, suffers in part from item formulations that can be expected to be too difficult for respondents not only at lower levels of education. For instance, such items revolve around one or more trait adjectives, may take up several lines, are conditional or otherwise too specific, or contain a negation. Apart from being a nuisance to respondents, such item characteristics might add to unreliable variance in the item responses.

In this report we briefly describe the construction and properties of the FFPI (for a full reporting see Hendriks, 1997). Some of its unique aspects are the following. Firstly, explicit guidelines for item production were used in order to avoid the above-mentioned drawbacks in the items as much as possible. Secondly, the items were empirically checked on their comprehensibility (among other things) for respondents with a relatively low level of education. Thirdly, translations into American-English and German were performed right at the level of the initial item pool, because we aimed at an instrument that does not call for language-specific (item) versions. The translatability of the items into these two other languages was made a prerequisite for their inclusion in the final item pool.

In general, the FFPI was to outperform the NEO-PI-R in being a reliable, valid and, most notably, efficient Big Five reference instrument: the FFPI stays within the five-space, whereas the NEO covers 30 primary dimensions, with the Big Five as second-order factors (hierarchical model).

### The Taxonomic Model

Point of departure for the construction of the FFPI was the AB5C taxonomic model of traits, of which the essentials are given below (for a full description see Hofstee et al., 1992).

The model accounts for the fact that simple structure, in which traits are associated with just one underlying dimension, is generally not encountered in the area of personality and individual differences. An example is Conscientiousness, which is used as a label for Factor III of the Big Five, but has a positive secondary loading on Factor II, Agreeableness (which trait in turn has a negative secondary loading on Factor I, Extraversion). It also appeared, however, that few traits have more than two sizeable factor loadings. The AB5C model therefore represents trait variables by their projections in a circumplexical plane, that is, by their two highest factor loadings. In total, there are ten ( $\frac{1}{2}n[n-1]$ , with  $n=5$ ) such planes.

Within each circumplexical plane, the model groups traits into 12 unipolar facets (circle segments of  $30^\circ$ ), again according to their loadings on the two pertaining factors. In this particular partitioning, the model seeks to optimize between specificity, on the one hand, and the extent to which nuances in trait meaning can be reliably distinguished by respondents, on the other. First, there are factor-pure facets containing the few items that show no secondary loading of any significance. Second, there are facets that arise through combination of a primary loading with a secondary loading on the positive or negative pole of the two factors involved in each circumplex. For example, Facet III+IV- contains traits that have their primary loading on the positive pole of Factor III, and a secondary loading on the negative pole of Factor IV. In total there are ten factor-pure unipolar facets and 80 ( $10 \times 8$ ) blends (combinations of the positive and negative pole of the same factor, for instance I+ and I-, are empty by definition). Table 1 contains examples taken from the study by Hofstee, De Raad, and Goldberg (1992) on American-English trait terms.

[Insert Table 1 about here]

The 65 well-filled facets from the Dutch AB5C-representation (Hofstee & De Raad, 1991) were used for the writing of items. These facets appeared to be quite well-spread across the model (see Hendriks, 1997, Table 4). The criterion to call a facet well-filled was that it

contained at least three trait adjectives loading .40 or higher. Teams consisting of the authors and students generated up to some 30 items per facet. Instructions were to represent the common meaning of the dispositional adjectives in a facet by a brief behavioral sentence, for example, 'gives orders' for Facet I+II-. In order to capture the common meaning, each facet was to be understood in a recursive way: by taking the shared meaning of its composing cluster of trait terms, while contrasting it to the meaning of its opposing cluster and centering it between its two adjacent clusters. Team sessions were held to evaluate the items as produced by each team member independently against explicit guidelines for item production (Hofstee, 1991). According to the outcome, items were kept, adapted, or discarded. A total of 909 sentence items resulted from this procedure.

This set of 909 sentence items was supplemented by a total of 136 sentence items based on personality-descriptive verbs (e.g., chat, deceive, help) which were chosen from the set described by De Raad, Mulder, Kloosterman, and Hofstee (1988) and transformed into brief sentences ('loves to chat', 'deceives people', 'helps others'). The reason to make these additions was that such items satisfy the criterion of concreteness, and might not have been generated by the other procedure.

Finally, as the Dutch Factor V has appeared to deviate from the American-English (Goldberg, 1992) and German (Ostendorf, 1990) Factors V, a large number of trait adjectives were collected that loaded on V in the latter studies, but especially the German study (showing the most explicit Intellect-factor). Their Dutch translations were grouped into clusters, and a total of 266 sentence items were written to represent these clusters.

Thus the well-filled facets and the clusters were used in a *heuristic* manner: They served the function of generating a sufficient number of items to adequately cover the Big-Five space (cf. De Raad & Hendriks, 1997). No attempt was made to cover the AB5C facets in an exhaustive manner. In the model, a person's score on a particular facet (e.g., III+I+) is a linear combination of his or her scores on two of the five Factors (.866 times the score on III plus .5 times the score on I, the constants being the cosines of 30° and 60°,

respectively). Any attempt to measure all 45 bipolar facets *directly* would result in either unreliable facet scores or a prohibitively long questionnaire. Also, such facet scores would contain specific variance that has no place in the five-dimensional taxonomy of trait structure.

### Guidelines for Item Production

The following rules were adopted for the writing of items:

(a) Items were written in the third person singular. In case of self-ratings, this formulation may stimulate the respondent to take an objective perspective.

(b) Elementary sentences were constructed, for example, 'helps others'. Any conditionings (e.g., 'helps others who are in need') and modifiers (e.g., 'tends to..', 'usually..', and the like) were avoided as much as possible. We reasoned that such complications detract from the comprehensibility of the item. In case of alternative formulations, we chose the simplest.

(c) Negations were excluded. At first, we applied this criterion in a liberal fashion, admitting standing expressions that contain a negation. However, it appeared that respondents became puzzled and irritated at just any negatively worded item. Consequently, such items were not selected for the final instrument.

(d) We purposely tried to avoid any formulations that are conspiratorial in one way or another. Idiomatic expressions, suggestive formulations ('bosses people around'), and sexist or ethnocentric formulation or content are cases in point. We intended to produce items that are fit for factual description.

(e) Most notably, and in contrast to all personality questionnaires that are known to us, we systematically banned all dispositional terms, particularly, trait-descriptive adjectives and nouns (e.g., 'shows irritation', which in this context is equivalent to 'is irritable'). One reason is that adjectives lists for measuring the Big Five are abundantly available, and little is gained by constructing sentences that revolve around such a trait (e.g., 'I am shy in the presence of

others'). Another consideration, which was vindicated by our empirical results, is that observable, concrete, and behavioral items require less inference from the respondent than dispositional terms; consequently, responses to such items should contain less error variance due to idiosyncratic interpretation of the meaning of the item. In a joint analysis of adjectives and concrete items, the primary factor loadings of the best items indeed appeared to be around .10 higher than those of any adjective. We have also observed that responding to the items takes less time, and is more agreeable with the subjects.

(f) No use was made of any existing questionnaire or item pool. An obvious reason is that few questionnaires have items that satisfy the above criteria. Furthermore, we wanted the FFPI to represent the Big Five structure generated by the lexical approach (see, e.g., John, Goldberg, & Angleitner, 1984), rather than be guided by conceptions from the personality questionnaire tradition.

### Item Translation

American-English and German versions of the item pool were constructed by teams consisting of the present authors, L.R. Goldberg, A. Angleitner and coworkers. A unique feature of the translation process was its interactiveness: Dutch items that proved difficult to translate were discarded or back-translated.

Translation into still other languages of the items that survived this procedure proved to be relatively easy. At present, there are approved versions of the FFPI in the Brazilian, Chinese, Croatian (Marusic, Bratko, & Bubas, 1997), Hebrew (Nussbaum & Kreitler, 1998), Hungarian, Italian (Perugini & Ercolani, in press), Japanese (Murakami, 1997), Polish, Slovak, Spanish (Rodriguez-Fornells, 1998), and Swedish languages; still others are coming up (e.g., Romanian). Here, the classical procedure is followed by which the present authors decide upon the adequacy of a translation on the basis of an independent back-translation. Colleagues who would be interested in producing a translation not yet mentioned are hereby



invited to contact one of the authors.

### Data Collection and Analyses

A total of 914 sentence items in three languages remained after the translation process. The following data were obtained for the purpose of item selection (for details, see Hendriks, 1997):

(a) Self-ratings on the 914 sentence items and on 225 selected trait adjectives by 167 students and staff members of psychology, and ratings by others who knew these persons well, up to four per target person, giving a total of 790 raters. Ratings were made on a 5-point Likert scale ranging from "Much less than others" to "Much more than others". The relationship between the sentence items and the (Big Five) trait structure was established, as well as the sentence items' self-(mean)peer validity.

(b) A number of 45 students in a lower professional school, expected to be of relatively low verbal intelligence, judged the 914 sentence items on comprehensibility. A number of 43 students of psychology judged the items on observability and 48 others on social desirability.

(c) On the basis of the above materials, Hendriks (1997) made a pre-selection of 284 sentence items and collected self-ratings on these items and the 225 adjectives by 125 psychology students, and ratings of these target persons by maximally 4 others, to a total of 601 ratings. Ratings were made on a 5-point Likert scale ranging from "Not at all applicable" to "Totally applicable". This data set was combined with the one ( $N = 790$ ) already available, resulting in a total of 1,311 raters, after deletion of subjects with suspect response profiles. A PCA followed by a varimax rotation was performed on the 284 sentence items, in order to establish their AB5C-facet positions.

### Item Selection

Several item sampling plans were considered. The idea of selecting only factor-pure items was quickly discarded, as there are not enough of them, some factor-pure facets being near-empty. We gave serious thought to the option of selecting a limited number of well-filled facets that together would span the five-space, and directly measuring each facet by a sufficient number of items to obtain a reliable facet score. We rejected this option as the questionnaire would become highly redundant, which is very annoying to respondents. We also considered scales for each factor that were balanced with respect to secondary loadings (e.g., a I+II+ and a I+II- item, etcetera). However, items with combinations of positive primary and negative secondary loadings, and *vice versa*, are relatively scarce; moreover, their projections in the five-space tend to be relatively small. Presumably, this is because such items, which combine desirable and undesirable aspects, are somewhat ambiguous. Finally we decided to select 20 good items per factor having their primary loading on that factor, to be spread across the different facets of the factor. Consequently, the unweighted sum scores of the items for the five scales are mostly positively correlated; to obtain orthogonal factor scores, an orthogonalization procedure is needed (cf. Costa & McCrae, 1992).

While one may criticize an item selection that produces correlated scales, the following should be taken into consideration. First, correlated scales are not unique to the FFPI: most (Big Five) scales, even those consisting of items that were carefully selected to be orthogonal to each other, appear to be correlated in fresh samples (see Digman, 1997). In case of the FFPI, this problem is explicitly dealt with. Second, the related argument referring to a cumbersome scoring procedure does not apply as computerized assessment is practiced more and more, and otherwise handtyping the 100 item scores will take less time than handscoring the paper-and-pencil version: a stand-alone Pascal scoring program<sup>2</sup> (available from the first author) will easily and reliably do the job.

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<sup>2</sup>Written by Henk Camstra from the Department of Psychology at the University of Groningen.

The following criteria for item quality were applied in the selection of the 100 items:

- (a) Factor loading: Items were selected for their primary loading, and for spread of secondary loadings so as to avoid redundancy.
- (b) Comprehensibility: A stringent cut-off point for comprehensibility was used, namely, 1.07 on a scale from 1 (perfectly comprehensible) to 3 (totally incomprehensible). In the other-language versions, some regression of this value may be expected.
- (c) Self-(mean)peer validity: Hendriks (1997) calculated correlations per item between self-ratings and averaged (per target) others' ratings. These values ranged from .13 to .69. Items were selected on this basis, with a lower bound of .22; the median self-(mean)peer validity of the FFPI-items is .44.
- (d) Other criteria: Observability and non-extreme social desirability served as marginal criteria. Variety of item content (see above) was a requirement that led to the rejection of otherwise good items. In view of all the different criteria, the item selection procedure could not be completely algorithmic, but it is well accounted for by the described procedure. Table 2 shows the mean values of the 100 FFPI items on the criteria for item selection.

[Insert Table 2 about here]

As becomes clear from Table 2, Factor V was interpreted as *Autonomy* rather than Intellect. Neither the trait-adjective based (five-)factor solution nor the sentence-items based (five-)factor solution showed Intellect to be the core meaning of the fifth factor, in spite of the purposeful overrepresentation of Intellect in both sets of variables. The Intellect-items merely spread across facets, the large majority of them being blends of Factors V and III, Conscientiousness. It is interesting to note that also the core of the American-English Factor V (see Saucier & Goldberg, 1996) appears to be represented by traits that rather refer to Autonomy (*philosophical, inquisitive, insightful*), whereas traits referring to Intellect

(*intelligent, intellectual, smart*) have their largest projections on the V+III+ blend in terms of AB5C modelling. Probably then, Autonomy should not be disposed of as a culture-specific factor, but may be seen as one of the serious candidate labels for this feeble (see De Raad & Van Heck, 1994; see also De Raad, 1994, 1998) fifth member of the Big Five.

### Scale Characteristics

Table 3 presents the intercorrelations among the five scales as obtained by unit weighting of the items. Correlations of .5 are observed among the Scales I, IV, and V as a consequence of shared secondary loadings of the items. Although the angles between these score vectors are in the order of 60°, and the scales have sufficient factor-specific variance given their high internal consistencies (Hendriks, 1997), we advise to compute factor scores. As mentioned before, a (Pascal) scoring program that will produce the uncorrelated factor scores from the 100 item scores can be obtained from the first author. The factor weights were established in a large ( $N = 2,494$ ) Dutch normative sample (Hendriks, Hofstee, & De Raad, in press).

[Insert Table 3 about here]

### Reliability, Validity and Stability

A first psychometric evaluation (Hendriks, 1997) of the FFPI undertaken in the same ( $N = 1,311$ ) data set in which the item selection took place showed promising results with respect to the internal consistency, construct validity and stability of the FFPI factor scores. Meanwhile, additional data sets became available for a further validity study. The joint results<sup>3</sup> are presented below. First, Table 4 gives the sample characteristics.

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<sup>3</sup>In all samples, FFPI factor scores were (newly) computed by applying the factor weights established in the Dutch

[Insert Table 4 about here]

### *Replicability of the Factor Structure and Internal Consistencies of the Components*

Each of the available data sets was subjected to PCA followed by a varimax rotation of the first five principal components, after having partialled out variance due to Acquiescent responding. Acquiescent responding refers to differential inconsistencies in responding to opposite items (e.g., intelligent/unintelligent, warm/cold); that is, people differ in the extent to which their mean score on a sizeable number of pairs of opposite items deviates from the scale midpoint (e.g., '3' on a 5-point scale), which differences can be reliably established. Acquiescence variance disturbs the factor structure of personality traits and should therefore be removed (Hofstee, Ten Berge, & Hendriks, 1998). The amount of variance accounted for by the Big Five factors in single ratings appeared to vary from 30.8 to 42.9 %, with an average value of 37.8 %. Not surprisingly, the amount of variance accounted for by the Big Five was higher in averaged other-ratings: 58.9 %. The amount of Acquiescence variance in the trait ratings varied from 3.2 to 8.3 %. Age appeared to be a variable of influence: higher amounts of Acquiescence variance were found in samples with a higher mean age. A table that presents the eigenvalues of the first five unrotated principal components, and the amount of variance accounted for by the Big Five, by Acquiescence and in total for all 14 samples can be obtained from the first author. Incidentally, FFPI factor scores computed by the above mentioned Pascal scoring program are problem-free with respect to Acquiescence variance, because the factor weights that are used have been established on the residual variance that remained after partialling out the Acquiescence factor (Ten Berge, in press).

Also obtainable from the first author is a table that presents the internal consistencies of the Big Five components and their congruence coefficients with the target (Hendriks,

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normative sample ( $N = 2,494$ ; Hendriks, Hofstee & De Raad, in press). So results may differ slightly from those already published (e.g., De Fruyt, 1997; Hendriks, 1997).

1997) structure after Procrustes rotation to optimal agreement, performed for all 14 samples. Two components are identical if Tucker's phi denotes .85 or higher (Haven & Ten Berge, 1977). We found phi coefficients generally to be in the (high) nineties, indicating excellent factor replicability in most of the samples. Clear exceptions were cancer patients (Van der Zee [1]) and their control group (Van der Zee [2]), with congruence coefficients of .86, .73, .78, .88, .77 (cancer patients) and .84, .78, .67, .82, .75 (control group) for Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Autonomy, respectively. Further study is needed to establish the reliability and validity of the FFPI in such specific samples.

Ten Berge and Hofstee (in press) offer a shortcut formula to compute coefficients alpha of orthogonally rotated principal components from those of unrotated principal components. To unrotated components, one may apply the formula  $(n/[n-1])(1-1/\lambda)$ , in which  $n$  equals the number of items and  $\lambda$  equals the eigenvalue of the component concerned (Kaiser & Caffrey, 1965). The coefficients alpha of the rotated components follow from applying the formula  $\alpha_j = \sum t_{ij}^2 \alpha_i$ , with  $t_{ij}$  elements of the rotation matrix  $T$  and  $\alpha_i$  the coefficients of the unrotated components (Kaiser, 1992). The coefficients alpha for the unrotated components clearly illustrate an upper limit to the number of components that can be extracted from questionnaire data. We found these coefficients to drop from a mean alpha of .94 for the first unrotated component to a mean alpha of .72 for the fifth unrotated component, which could lead to the conclusion that five components may already be one too many, taking reliability into account. Not surprisingly, the values for the rotated components more or less reflect this tendency, as the sum of alpha reliabilities remains constant (Ten Berge & Hofstee, in press). Satisfactory alpha reliabilities were found for Extraversion ( $\alpha$  on average .86), Agreeableness ( $\alpha$  on average .84), Conscientiousness ( $\alpha$  on average .86) and Emotional Stability ( $\alpha$  on average .85). Autonomy ( $\alpha$  on average .81) appears to be somewhat less internally consistent, especially in heterogeneous samples, probably because the items are inherently more abstract. We found Autonomy to be the one factor slightly related (.15 to .20) to level of education. For applied purposes, however, Autonomy might be an interesting

variable and, in any case, the alpha reliabilities of its blends with the four other factors (= facet scores) will be boosted to satisfactory heights.

### *Criterion Validity*

Additional indications of construct validity were obtained from correlations ( $N = 260$ ) between factor scores taken from self-ratings and from averaged acquaintance/peer scores per target across 2-4 other-ratings. Agreement between these two sets of factor scores indicate criterion validity. Autonomy showed the lowest, but still reasonable, value: .54 (.64, if corrected for predictor and criterion unreliability); substantial (uncorrected) correlations were found for Extraversion (.73), Agreeableness (.70), Conscientiousness (.70) and Emotional Stability (.68).

### *Convergent Validity*

Further indications of construct validity were obtained from the relationship between the FFPI and three alternative Big Five measures: (1) a 225-item trait-adjective rating list (for details, see Hendriks, 1997), (2) the NEO-PI-R (Costa & McCrae, 1992; Dutch translation: Hoekstra, Ormel, & De Fruyt, 1996), and (3) the Berkeley Personality Profile (Harary & Donahue, 1994). The correlations between FFPI and trait-adjective rating list are presented in Table 5. In self-ratings, the convergent validities ranged from .78 (Autonomy) to .86 (Conscientiousness). In averaged other-ratings, the convergent validities ranged from .85 (Autonomy) to .92 (Extraversion). Even cross correlations (self-ratings on one instrument correlated with averaged other-ratings on the other instrument), which share less method variance, show moderate to substantial values. The overall highest convergent validities were found for Conscientiousness, Extraversion and Emotional Stability.

[Insert Table 5 about here]

[Insert Table 6 about here]

Convergent validities with the NEO-PI-R (Domain scales) and Berkeley Personality Profile (BPP) are presented in Table 6; these validities pertain primarily to self-ratings. We also present in this table correlations between FFPI other-ratings and NEO self-ratings, which share less method variance and serve the purpose of cross-validation. A clear convergent validity was found for Extraversion, Agreeableness, Conscientiousness and Emotional Stability (reversed). For these factors, the diagonal values are highest. The substantial negative correlation between FFPI-Conscientiousness and NEO-Openness to Experience supports the construct validity of this FFPI factor, the core meaning of which refers to planned, purposeful, actions (without indulging in fantasies, feelings, ideas, etcetera). Autonomy appears to have more in common with BPP-Intellectual style (.41) than with NEO-Openness. A value of .6 between FFPI-Autonomy and NEO-Openness as observed in the De Fruyt's sample seems best interpreted as a sample fluctuation, as other (Marusic, Bratko, & Bubas, 1997; Perugini & Ercolani, in press; Rosendahl, 1997) findings suggest this correlation to be .3 to .4 at most. Correlations with NEO-Facets (not further presented here)<sup>4</sup> suggest that Autonomy partly denotes leadership. Table 7 shows the core meaning of the FFPI factors by means of their highest loading factor-pure sentence items.

[Insert Table 7 about here]

### *Relationship with Psychopathology*

Finally, indications of construct validity were obtained from the relationship between the FFPI and the Questionnaire on Personality Traits (VKP; Duijsens, 1996), a self-rating instrument to assess personality disorders. Table 8 gives the results.

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<sup>4</sup>Table available from the first author.



[Insert Table 8 about here]

Quite comparable results were found for self-ratings and other-ratings, except for Extraversion, which dimension appeared to correlate (negatively) with many more disorders in self-ratings (both disorders and personality were rated by the target person) in comparison with other-ratings (disorders were rated by the target person, personality was rated by someone who knew the target person well). The overall picture is that especially Conscientiousness and Emotional Stability relate (negatively) to psychopathology. Because the present sample stems from the normal population, probably the Total score (total number of criteria that were met) is the most informative measure in this table. The relationship of Emotional Stability (i.e., Neuroticism) with psychopathology is well-established (Duijsens, 1996). Regarding Conscientiousness (i.e., Unconscientiousness), our results are more exceptional, but still interpretable, taking the behavioral descriptions of the various disorders (see, for instance, Phillips & Gunderson, 1994) into account. Some examples of items that load on the negative pole of this FFPI factor are: *Does things that are out of bound* (III-II-), *Does dangerous things* (III-II-), *Runs wild* (III-IV-), *Indulges in his/her fantasies* (III-IV-), and *Neglects his/her duties* (III-V-); see Hendriks, 1997. Not finding a (positive) relationship between Conscientiousness and the Obsessive-Compulsive (c.q. Anankastic) disorder can be explained from the fact that people who have this disorder are so much preoccupied with orderliness, perfectionism, and keeping in control of people and situations that it interferes with a successful completion of tasks, whereas the latter (accomplishing tasks successfully and in time) exactly characterizes people scoring high on Conscientiousness.

Taking the entries on the right-hand side of Table 8 as confirmative information to the left-hand side, we found Extraversion to be mainly (negatively) related to disorders that have social isolation in common. These relationships support the construct validity of this FFPI factor, whose core meaning refers to the need for, and ease of, communication with others

versus avoiding (communication with) others. Agreeableness appeared to correlate negatively with the Narcissistic (c.q. Dissocial) disorder, which characterizes people who use others for their own ends, believe that they are important and better than others, lack consideration for others' needs or feelings, and generally feel no mercy when having shortchanged others (on purpose). Contrary to earlier findings (see Duijsens, 1996, Table 6.4), no (negative) relationships were found with the Paranoid and Borderline disorders. These findings support the construct validity of FFPI Agreeableness as primarily referring to (not) taking others' needs, feelings, interests (etcetera) into account, and not so much to (the absence of) suspiciousness and distrust that is part of NEO-Agreeableness. Finally, Autonomy appeared to be (negatively) related to the Avoidant (c.q. Anxious) and Dependent disorders. These are appropriate relationships, given that this fifth FFPI factor is defined in part by items like *Knows how to get things done* (V+I+), *Is able to stand up for himself/herself* (V+I+), *Decides things on his/her own* (V+IV+), and *Knows what he/she wants* that load on the positive pole, and items like *Lets others make the decisions* (V-I-), *Is easily intimidated* (V-IV-), *Feels unable to deal with things* (V-IV-), and *Can't stand on his/her own* (V-IV-) that load on the negative pole.

### *Stability*

Test-retest correlations were computed for both a six-months and a one-year time span between assessments. Across the six-months time span, we found stability values ( $N = 178$ ; Hendriks, 1997) of .79, .79, .83, .82 and .79 for Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Autonomy, respectively. Across the one-year time span, the stability values ( $N = 1768$ ) appeared to be .79, .74, .77, .75 and .76 for Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Autonomy, respectively. These latter values, however, were computed on the basis of 50 FFPI items (10 items per factor), as circumstances (limited resources which had to be shared with other researchers) prevented us from administering the entire FFPI to subjects; they therefore

underestimate the true values.

### Applied Settings: Facet Scores

In applied settings, an assessor may wish to report more specific information in addition to a target person's position on Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Autonomy. As has been briefly mentioned in the Introduction section, 40 bipolar (80 unipolar) facet scores can be computed as linear combinations of the target person's factor scores. The alpha-reliabilities of the facet scores equal the weighted sums of the alpha-reliabilities of the two pertaining factors, and can be found by applying the formula for rotated principal components  $\alpha_j = \sum t_{ij}^2 \alpha_i$  (Ten Berge & Hofstee, in press), with  $t$  being  $(.866)^2$  for the primary factor and  $(.5)^2$  for the secondary factor defining a particular facet. From our findings regarding the reliabilities of the five factor scores, it follows that --in student and in more heterogeneous samples-- all facet scores will have satisfactory reliabilities (somewhere in between the values for the two pertaining factors). A computerized scoring procedure for the computation of a person's (highest) facet scores, and additional information on facet content for the purpose of interpretation, will become available from a commercial publisher upon completion of the manual, in due time. It should be stressed once more that facet scores contain no specific variance over and above the variance accounted for by the two pertaining Big Five factors, as the former are linear combinations of the latter. Therefore, the utility of facet scores lies in the applied context only.

### Conclusion

The Five-Factor Personality Inventory (FFPI) consists of 100 brief and concrete items that are relatively easy to translate into other languages. In student and in more heterogeneous samples, the factor scores (Extraversion, Agreeableness, Conscientiousness, Emotional

Stability and Autonomy) are sufficiently (Autonomy) to highly reliable, stable, and of good construct validity. With respect to specific samples (e.g., patients; clinical populations), further studies are needed.

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Table 1. *Illustrative clusters of trait terms according to the AB5C taxonomic model*

I+II-	III+IV+	V+
Dominant	Thorough	Creative
Domineering	Steady	Imaginative
Forceful	Consistent	Philosophical
	<i>versus</i>	
I-II+	III-IV-	V-
Timid	Inconsistent	Uncreative
Unaggressive	Scatterbrained	Unintellectual
Submissive	Unstable	Unintelligent

Table 2. *Mean values of the 100 FFPI items on the criteria for item selection*

		<i>n</i> items	<i>M</i>	( <i>SD</i> )	Range	<i>Md</i>
AB5C-facet projection*:						
I	Extraversion	20	0.64	(0.05)	0.52 - 0.70	0.65
II	Agreeableness	20	0.62	(0.07)	0.46 - 0.74	0.63
III	Conscientiousness	20	0.61	(0.06)	0.52 - 0.71	0.62
IV	Emotional Stability	20	0.64	(0.06)	0.53 - 0.71	0.64
V	Autonomy	20	0.57	(0.06)	0.47 - 0.69	0.58
Self-(mean)peer validity:						
I	Extraversion	20	0.51	(0.06)	0.41 - 0.65	0.50
II	Agreeableness	20	0.40	(0.09)	0.27 - 0.57	0.41
III	Conscientiousness	20	0.47	(0.09)	0.32 - 0.62	0.46
IV	Emotional Stability	20	0.44	(0.09)	0.29 - 0.61	0.45
V	Autonomy	20	0.37	(0.09)	0.22 - 0.55	0.38
Difficulty**:						
I	Extraversion	20	1.01	(0.02)	1.00 - 1.04	1.00
II	Agreeableness	20	1.01	(0.01)	1.00 - 1.04	1.02
III	Conscientiousness	20	1.01	(0.02)	1.00 - 1.04	1.00
IV	Emotional Stability	20	1.02	(0.02)	1.00 - 1.07	1.01
V	Autonomy	20	1.01	(0.02)	1.00 - 1.07	1.02
Observability***:						
I	Extraversion	20	3.76	(0.47)	2.81 - 4.33	3.70
II	Agreeableness	20	3.82	(0.39)	3.00 - 4.51	3.79
III	Conscientiousness	20	3.72	(0.43)	2.74 - 4.53	3.68
IV	Emotional Stability	20	3.37	(0.48)	2.63 - 4.42	3.34
V	Autonomy	20	3.61	(0.31)	3.21 - 4.21	3.52
Social Desirability****:						
I	Extraversion	20	3.17	(0.85)	2.04 - 4.27	3.05
II	Agreeableness	20	3.04	(1.02)	1.83 - 4.27	3.02
III	Conscientiousness	20	3.10	(0.72)	1.88 - 4.40	3.21
IV	Emotional Stability	20	3.02	(0.85)	1.85 - 4.23	2.67
V	Autonomy	20	3.06	(0.85)	1.90 - 4.08	3.25

*Note.* \*Absolute values. \*\*1 = Perfectly comprehensible, 3 = Totally incomprehensible. \*\*\*1 = Not or hardly observable to others, 5 = Clearly observable to others. \*\*\*\*1 = Very negative, 5 = Very positive.

Table 3. *Intercorrelations of the five scales of the FFPI upon unit weighting of the items*

	Scale II	Scale III	Scale IV	Scale V
Scale I	.15	-.01	.48	.53
Scale II		.34	.29	.02
Scale III			.13	.03
Scale IV				.48

Table 4. *Sample characteristics*

Source	Sample	Type of ratings	N (total)	Sex		Age		
				Males	Females	Range	M	Sd
CentER, Tilburg (1)	Representative panel	Self-ratings	2494	1367	1127	16-91	46.5	15.4
CentER, Tilburg (2)	High income panel	Self-ratings	683	375	308	16-82	47.2	13.7
Hendriks, Univ. of Groningen	Students of Psychology Heterogeneous	Self-ratings	260	74	185	18-71	22.0	7.3
		Other-ratings	292*	379	662	15-99	30.1	14.2
De Fruyt, Univ. of Ghent	Semi-heterogeneous	Self-ratings	105	25	79	17-62	26.6	12.7
Duijsens, Univ. of Leiden	Heterogeneous Heterogeneous	Self-ratings	143	58	82	16-87	40.8	15.3
		Other-ratings	137	-	-	-	-	-
Buunk, Univ. of Groningen	Semi-heterogeneous	Self-ratings	163	56	107	18-72	24.9	9.6
Van der Zee (1), Univ. of Groningen	Cancer patients	Self-ratings	99	36	61	26-100	58.5	13.3
Van der Zee (2), Univ. of Groningen	Control group	Self-ratings	64	28	36	32-80	60.6	12.7
Boter (1), Univ. of Utrecht	Students of Music, Theatre, and Film	Self-ratings	104	28	76	18-63	21.5	4.7
Boter (2), Univ. of Utrecht	Theatre visitors	Self-ratings	216	77	139	15-77	39.1	14.4
Boter (3), Univ. of Utrecht	Museum visitors 50+	Self-ratings	236	110	125	50-88	63.6	8.3
Schouwenburg, Univ. of Groningen	Students, diverse	Self-ratings	315	93	218	18-48	22.7	3.1

Note. \* Averaged scores per target across 2-4 other-ratings.

Table 5. Significant relationships between the FFPI and the adjective-based Big-Five structure

FFPI Self-ratings								FFPI Other-ratings <sup>a</sup>						
Trait-adjectives:	Source	N	F1	F2	F3	F4	F5	Source	N	F1	F2	F3	F4	F5
<b>Self-ratings:</b>														
Extraversion	Hendriks	255	<b>.81***</b>				.12*	Hendriks	255	<b>.65***</b>				
Agreeableness	Hendriks	255	-.16*	<b>.79***</b>	-.17**	.16*	-.28***	Hendriks	255		<b>.56***</b>			<b>-.41***</b>
Conscientiousness	Hendriks	255			<b>.86***</b>			Hendriks	255			<b>.70***</b>		
Emotional Stability	Hendriks	255				<b>.85***</b>		Hendriks	255				<b>.63***</b>	
Autonomy	Hendriks	255			-.27***		<b>.78***</b>	Hendriks	255		-.14*	-.21**		<b>.43***</b>
<b>Other-ratings<sup>a</sup>:</b>														
Extraversion	Hendriks	146	<b>.71***</b>					Hendriks	167	<b>.92***</b>		-.15*		
Agreeableness	Hendriks	146		<b>.59***</b>			-.28***	Hendriks	167		<b>.89***</b>			-.25**
Conscientiousness	Hendriks	146			<b>.62***</b>			Hendriks	167			<b>.91***</b>		.20**
Emotional Stability	Hendriks	146				<b>.65***</b>		Hendriks	167				<b>.91***</b>	
Autonomy	Hendriks	146		-.21**			<b>.49***</b>	Hendriks	167					<b>.85***</b>

Note. FFPI: F1=Extraversion, F2=Agreeableness, F3=Conscientiousness, F4=Emotional Stability, F5=Autonomy. Correlations with absolute values  $\geq .30$  printed in bold. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; italic values tested one-sided. <sup>a</sup> Averaged scores per target across 2-4 other-ratings.

Table 6. *Significant relationships with alternative Big Five measures*

F F P I Self-ratings								F F P I Other-ratings <sup>a</sup>						
Instruments:	Source	N	F1	F2	F3	F4	F5	Source	N	F1	F2	F3	F4	F5
<b>NEO-PI-R Domain scales<sup>b</sup>:</b>														
E Extraversion	Hendriks	90	<i>.80</i> <sup>***</sup>	-.23 <sup>**</sup>			.28 <sup>**</sup>	Hendriks	92	<i>.54</i> <sup>***</sup>		-.22 <sup>*</sup>		.28 <sup>**</sup>
	De Fruyt	100	<i>.77</i> <sup>***</sup>	-.27 <sup>**</sup>			<i>.34</i> <sup>***</sup>							
A Agreeableness	Hendriks	88		<i>.69</i> <sup>***</sup>			<i>-.38</i> <sup>***</sup>	Hendriks	91		<i>.51</i> <sup>***</sup>			-.28 <sup>**</sup>
	De Fruyt	102		<i>.61</i> <sup>***</sup>			-.20 <sup>*</sup>							
C Conscientiousness	Hendriks	95			<i>.75</i> <sup>***</sup>			Hendriks	98			<i>.70</i> <sup>***</sup>		
	De Fruyt	101			<i>.81</i> <sup>***</sup>									
N Neuroticism	Hendriks	94				<i>-.83</i> <sup>***</sup>		Hendriks	96			-.21 <sup>*</sup>	<i>-.59</i> <sup>***</sup>	
	De Fruyt	100	-.21 <sup>*</sup>			<i>-.67</i> <sup>***</sup>								
O Openness to Exp.	Hendriks	92	-.18 <sup>*</sup>	<i>.31</i> <sup>**</sup>	<i>-.51</i> <sup>***</sup>		.20 <sup>*</sup>	Hendriks	95			<i>-.50</i> <sup>***</sup>	-.24 <sup>*</sup>	.28 <sup>**</sup>
	De Fruyt	102			<i>-.60</i> <sup>***</sup>	-.28 <sup>**</sup>	<i>.60</i> <sup>***</sup>							
<b>Berkeley Personality Profile<sup>c</sup>:</b>														
Expressive style	Schouwenburg	315	<i>.83</i> <sup>***</sup>	-.11 <sup>*</sup>	-.13 <sup>*</sup>		<i>.33</i> <sup>**</sup>							
Interpersonal style	Schouwenburg	315	<i>.30</i> <sup>**</sup>	<i>.58</i> <sup>***</sup>			<i>-.30</i> <sup>**</sup>							
Work style	Schouwenburg	315			<i>.78</i> <sup>***</sup>		.18 <sup>**</sup>							
Emotional style	Schouwenburg	315	-.29 <sup>**</sup>		.17 <sup>**</sup>	<i>-.81</i> <sup>***</sup>	-.13 <sup>*</sup>							
Intellectual style	Schouwenburg	315			-.13 <sup>*</sup>		<i>.41</i> <sup>***</sup>							

Note. Correlations with absolute values  $\geq .30$  printed in bold. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; italic values tested one-sided. <sup>a</sup>Averaged scores per target across 2-4 other-ratings. <sup>b</sup>Costa & McCrae (1992); Dutch translation: Hoekstra, Ormel, & De Fruyt (1996); self-ratings. <sup>c</sup>Harary & Donahue (1994).

Table 7. *Core meaning of the FFPI factors: highest loading factor-pure sentence items*

Factor	Item	Loading
Extraversion	Loves to chat	.66
	Laughs aloud	.50
	Slaps people on the back	.40
	Keeps apart from others	-.70
	Avoids contacts with others	-.70
	Avoids company	-.69
Agreeableness	Respects others' feelings	.65
	Takes others' interests into account	.65
	Is willing to make compromises	.55
	Imposes his/her will on others	-.69
	Orders people around	-.65
	Uses others for his/her own ends	-.65
Conscientiousness	Does things according to a plan	.71
	Likes to follow a regular schedule	.69
	Works according to a routine	.68
	Acts without planning	-.67
	Makes a mess of things	-.64
	Does things at the last minute	-.61
Emotional Stability	Can take his/her mind off his/her problems	.69
	Readily overcomes setbacks	.61
	Is always in the same mood	.50
	Invents problems for himself/herself	-.71
	Gets overwhelmed by emotions	-.67
	Has crying fits	-.63
Autonomy	Can easily link facts together	.60
	Wants to form his/her own opinions	.58
	Thinks quickly	.57
	Follows the crowd	-.57
	Copies others	-.55
	Does what others do	-.55



Table 8. *Significant relationships with psychopathology*

VKP <sup>b</sup> :	FFPI Self-ratings (N = 143)					FFPI Other-ratings (N = 137) <sup>a</sup>				
	F1	F2	F3	F4	F5	F1	F2	F3	F4	F5
<b>DSM-IV:</b>										
Paranoid	-.17*			-.32***					-.23**	
Schizoid	-.33***					-.18*			.18*	
Schizotypal	-.25**		-.36***					-.30***		
Antisocial			-.29***					-.27**		
Borderline			-.19*	-.46***				-.25**	-.39***	
Histrionic		-.19*	-.18*	-.22**				-.19*	-.19*	
Narcissistic		-.25**	-.19*				-.21*	-.21*		
Avoidant	-.39***			-.35***	-.36***	-.21*		-.17*	-.21*	-.17*
Dependent	-.21*			-.41***	-.24**				-.21*	-.27***
Obsessive Compulsive	-.18*									
Passive Aggressive	-.24*		-.22**	-.34***				-.25**	-.18*	
Depressive	-.29**			-.47***					-.28**	
Total <sup>c</sup>	-.29**		-.23**	-.38***				-.26**	-.26**	
<b>ICD-10:</b>										
Paranoid				-.32***					-.25**	
Schizoid	-.37***					-.23**			.17*	
Dissocial		-.24**	-.29***				-.19*	-.29***		
Impulsive			-.17*	-.37***				-.19*	-.31***	
Borderline			-.21**	-.43***				-.24**	-.36***	
Histrionic			-.27**	-.29***				-.32***	-.19*	
Anankastic				-.17*						
Anxious	-.34***			-.49***	-.24**	-.19*			-.23**	-.17*
Dependent	-.20*			-.42***	-.19*				-.24**	-.19*
Total <sup>c</sup>	-.26**		-.20*	-.42***				-.21*	-.25**	

Note.: FFPI: F1=Extraversion, F2=Agreeableness, F3=Conscientiousness, F4=Emotional Stability, F5=Autonomy. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$  (two-sided). Correlations with absolute values  $\geq .30$  printed in bold. <sup>a</sup>Single other-rating. <sup>b</sup>Questionnaire on Personality traits (Duijsens, 1996). <sup>c</sup>Total=Total number of criteria that were met.